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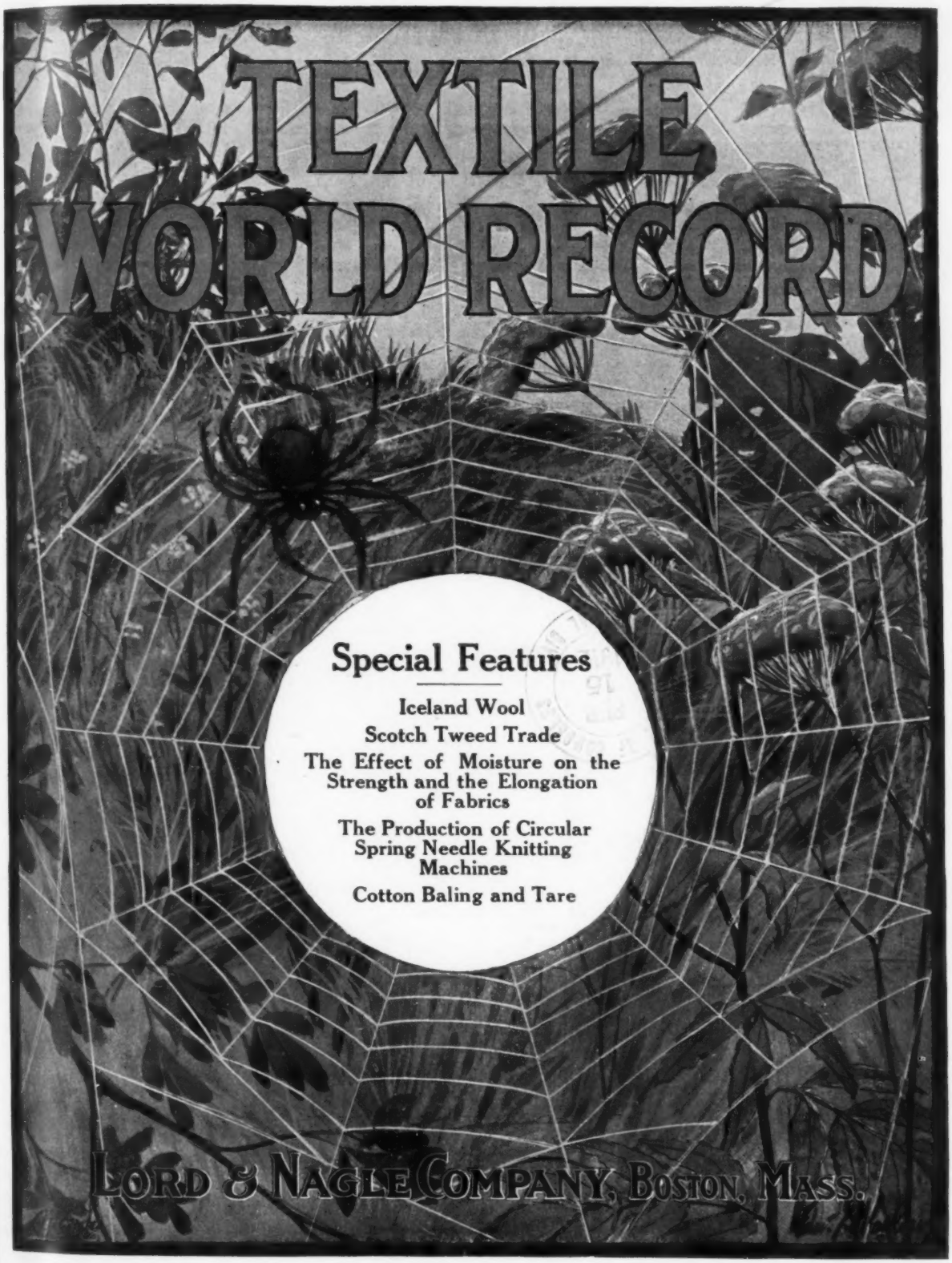
TEXTILE
WORLD RECORD
Special Features
Iceland Wool
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The Effect of Moisture on the Strength and the Elongation of Fabrics
The Production of Circular Spring Needle Knitting Machines
Cotton Baling and Tare
LORD & NAGLE COMPANY, BOSTON, MASS.

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The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

BUILDERS OF

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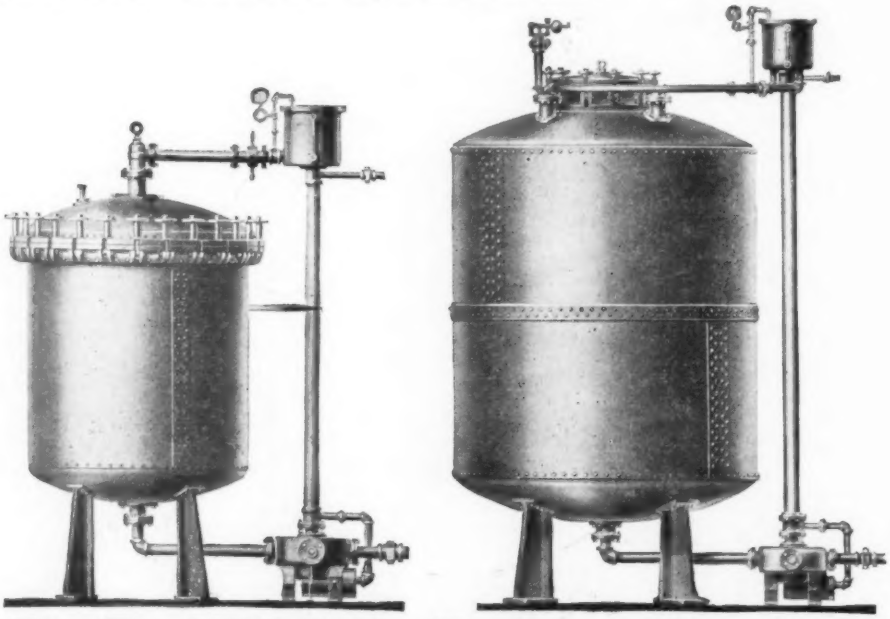

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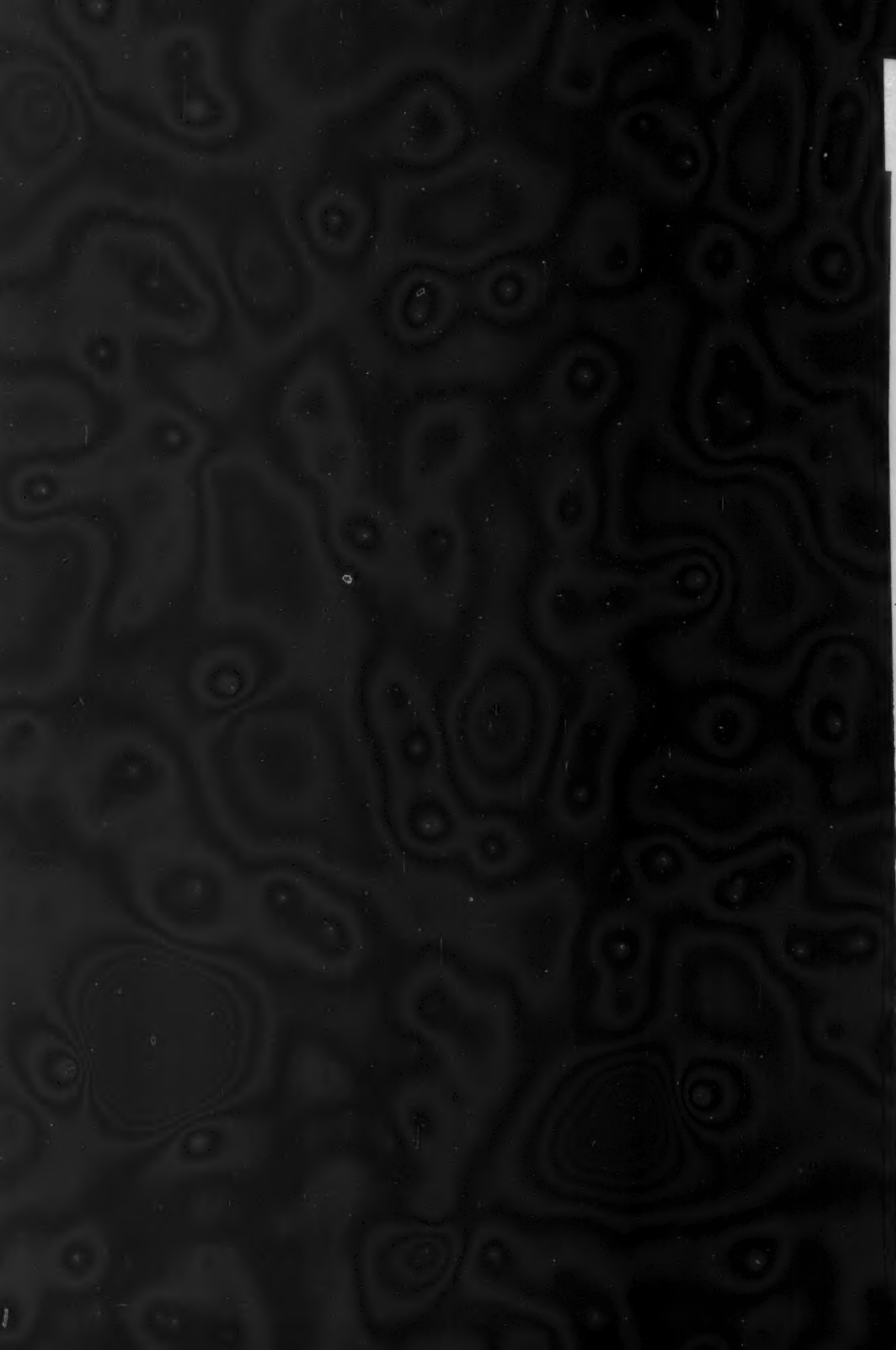

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Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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TEXTILE WORLD RECORD

FEBRUARY, 1912

Monthly Comment.

Cotton Baling and Tare

Several months ago Representative W. G. Brantley, of Georgia, requested the Secretary of State to investigate the present method of baling cotton and of making allowance for cotton tare, in order if possible to remedy abuses which it was claimed was costing the American cotton growers approximately $12,000,000 a year. In compliance with this request Secretary of State Knox directed the American consuls at various European ports to make an investigation of the conditions in their respective districts and report to the Department at Washington.

Last month Secretary Knox transmitted to Congressman Brantley consular reports on this subject from Liverpool, Manchester, Bremen, Hamburg, Rotterdam, Antwerp, Havre, Marseille, Genoa, Naples, Trieste, Stockholm and Barcelona. In his letter of transmittal to Congressman Brantley, Secretary Knox said:

> I have caused a number of reports to be prepared by American consular officers especially directed as follows:
>
> First. To present the facts with respect to the "tare" charged in the handling of American cotton;
>
> Second. To explain why an excess charge is made against American cotton as compared with the "tare" charge reckoned against the cotton of other countries;
>
> Third. To state the actual charge for "tare," and the manner in which it is ascertained, against Egyptian, Indian and other cotton competing in foreign markets with that of American growth; and
>
> Fourth. Personally to examine into the condition and appearance of all classes of cotton shipments upon the arrival and unloading at foreign ports, so that comparisons could be drawn as between the shipments from American and those from competing countries.
>
> The result of the present investigation appears to me convincing that concerted action on the part of the cotton states providing legal standards for the "tare" of cotton would remove the cause of the loss now borne in the marketing.
>
> The producers of other nations, now supplying nearly 40 per cent. of the cotton imports required by the world's great consuming markets, have so standardized and perfected their methods of baling that the ultimate buyer is content with such an allowance from the gross weight of the bale as is represented by the actual weight of the iron bands and the covering. The arbitrary charge for "tare" against cotton of American production apparently can be overcome only when the American bale similarly is standardized. When this is accomplished there will exist no incentive for an excess allowance, since it appears that foreign buyers are willing to buy on the terms of actual "tare" when this can be arrived at readily with a reasonable certainty.

It is gratifying to have the important questions of cotton tare and cotton baling taken up by the State Department and it is to be hoped that the prestige which naturally is attached to such an important department of the Government will result in bringing about an improvement in existing methods.

For years the wasteful methods of baling American cotton and the inaccurate allowance for tare have been repeatedly exposed in the press and by trade associations. Many

plans have been suggested for remedying the abuses, all without success. A striking exposure of the abuses of baling American cotton was made in our report on the Manchester Cotton Congress presented to the New England Cotton Manufacturers' Association at Atlantic City on Sept. 20, 1905. An equally striking exposure of the inaccuracy of the 6 per cent. allowance for tare on export cotton appeared in the Textile World Record for February, 1908, in the form of a letter from a man who had been connected with an English cotton mill and who gave the invoice and mill weights of 200 bales of "cif" cotton. His statement showed that the mill had received 1,159 pounds, or 2 bales, of cotton more than had been paid for. We have withheld the name of the English mill from publication in order to protect our informant and his friends in Lancashire, but we have a photograph of the invoice and the consent of our informant to publish it if in our judgment that course should ever become necessary. The invoice and mill weights of the 200 bales of cotton were as follows:

As Invoiced.

Gross Weight		102,421 pounds
Tare: bands	1,715 pounds	
bagging	3,957 "	5,312 pounds
Net weight invoiced		97,109 "

As Weighed at Mill.

Gross Weight		102,480 pounds
Tare: bands	1,181 pounds	
bagging	2,931 "	4,212 pounds
Net weight at mill		98,268 "
Overweight not paid for		1,159 "

We showed at the time that at this rate the loss would amount to 104,655 bales of cotton valued at $5,785,000 on the cotton exported from the United States in 1907.

While Secretary Knox has rendered an important service to the American cotton trade by calling attention to these abuses, he has unfortunately fallen into a serious error when attempting to point out the remedy for the evils. The Secretary states in his letter to Congressman Brantley that the arbitrary charge for tare can be overcome only when the American bale is standardized, that is, properly packed. In reaching this conclusion Secretary Knox has made the mistake of taking the effect for the cause. The actual fact is that the ragged and disgraceful method of baling American cotton is to a great extent due to this arbitrary charge of 6 per cent. for tare. As long as an allowance of 30 pounds is made on a 500 bale of cotton the American shipper will make sure that the bale contains fully 30 pounds of banding and bagging, because he knows that the foreign buyer will not make any credit return if the actual tare is found to be less than the allowance of 6 per cent.

Neither is Secretary Knox's statement correct that foreign buyers are willing to buy American cotton on net weight terms. A few of them may be willing and foreign trade associations may pass pious resolutions to that effect, but it remains a fact that the allowance of 6 per cent. for tare continues to be enforced because the foreign trade insist upon it as an established custom. So long as this is the case just so long will extra bagging be stuffed into American cotton bales to make up the allowance of 6 per cent., and just so long will the American cotton bale be a fit subject for ridicule and a standing disgrace.

Woolen Manufacturers Looking for Better Times

The Wonalancet Co., of Nashua, N. H., manufacturers of carded cotton for woolen mills, in sending out to the trade at the first of the year a daily wall calendar, enclosed with it a reply card in which they asked the recipient to express his opinion as to the trade outlook for 1912 as compared with 1911.

It is interesting to note that 86 per cent. of the replies indicated a belief in much better business this year than last, and this in spite of tariff uncertainties and the presidential election.

In our December issue we printed a summary of the investigation recently conducted by the National Association of Manufacturers among ten thousand business men in different lines of industry. It may be remembered that in this summary of the report, 50 per cent. of the woolen manufacturers reported the prospects fair for 1912; 13

per cent. good; 4 per cent. excellent and only 33 per cent. poor.

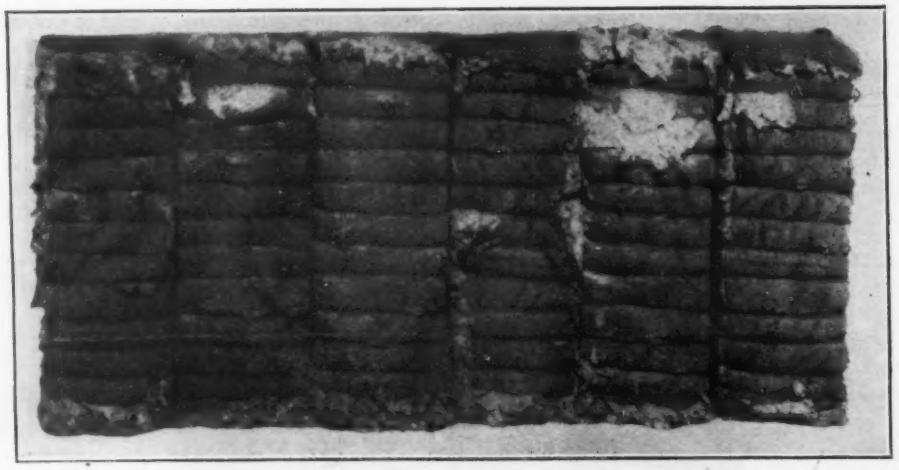
—÷—

King Cotton

When King George reached Bombay on his recent visit to India he found that one of the triumphal arches erected in his honor represented King Cotton, a monarch whose dominions are more extensive, whose influence over mankind is greater, and whose dynasty is far more secure than his own. This arch at Bombay, of which we show an illustration taken from the Manchester Guardian, consisted of bales of Indian cotton and bore the greetings of the Indian cotton trade to the British king. Without the aid of subsidies the cotton crop of India has become an important factor in the world's cotton supply. It amounted to 5,000,000 bales a few years ago. As the spinners of Lancashire lose faith in the possibilities of raising cotton in Africa, where it has refused to grow in large quantities, they have turned their attention to developing cotton growing in India, where it was an important crop at the dawn of history.

Indian cotton is short and dirty. Moreover the crop of 5,000,000 bales looks small compared with 15,000,000 bales of American cotton. But large as the American crop is, clean, long and strong as is the American staple, it remains a deeply regrettable fact that the fifteen million bales of American cotton as now prepared for market would not yield material for an arch such as met the gaze of King George at Bombay. An arch built of American cotton bales would be a triumphal arch, but it would be the triumph of slovenliness. The appearance of an American arch is suggested by the accompanying view of a Liverpool cotton shed filled with American bales. Alongside of this exhibit we will place an illustration of six Indian bales like those of which the Bombay arch was built. A comparison of the two strengthens the belief that the construc-

FOR THE ROYAL VISIT TO BOMBAY, ONE OF THE TRIUMPHAL ARCHES WAS BUILT OF COTTON



SIX BALES OF EAST INDIA COTTON SHOWING HOW CLOSELY THE BALES PACK TOGETHER

tion of the American arch should be delayed until Secretary Knox's suggestion as to the baling of the American crop has been carried into effect.

PHOTOGRAPH OF A COTTON SHED SHOWING THE USUAL CONDITION IN WHICH AMERICAN COTTON IS LANDED IN LIVERPOOL

Cotton Goods in the Philippines

The imports of cotton goods into the Philippines for the twelve months ending June, 1911, are reported by the Bureau of Insular Affairs as follows:

	United States.	All other countries.
Unbleached cloths	$174,077	$74,429
Bleached cloths	954,927	1,408,260
Dyed cloths	1,282,951	1,299,188
Embroidered cloths	456	82,220
Printed cloths	1,080,988	771,109
Blankets	16,921	35,189
Clothing	23,444	76,062
Undershirts and drawers	67,890	805,113
All other knit goods	7,822	4,703
Coats, trousers and vests	42,516	1,269
Collars, cuffs and shirts	51,202	16,489
Dress, skirts, etc.	11,063	2,997
Waterproof garments	20,461	9,996
Clothing and other apparel	46,161	47,260
Gum elastic fabrics	23,182	3,782
Handkerchiefs	23,502	163,191
Lamp wicks	1,493	5,098
Piques	2,120	30,554
Plushes, velvets, etc.	25	15,821
Shoe and corset lacings	4,725	3,884
Towels	13,159	49,096
Trimmings, ribbons, etc.	1,237	63,528
Tulles and laces	1,124	125,731
Waste cotton	16,493	14,626
Thread	161,477	226,949
Mercerized yarn	30	144,101
Unbleached yarn	343	28,084
Bleached yarn	67	341,133
Dyed or colored yarn	181,158	126,051
All other manufactures of cotton	81,324	36,766
	$4,292,338	$6,012,679

American Brand Names in the Orient

In the palmy days of the American merchant marine New England cotton mills were largely financed by New England ship owners and merchants who had made fortunes in the trade in the far East. It was natural that they should carry the manufactured goods from the New England cotton mills in their ships to the Orient. Before the days of the telegraph and cable the merchant loaded his ships with goods that he thought could be sold in the country to which his vessel was bound. He did not wait to get orders, he had to use his best judgment in making up his cargo and disposing of it. He usually owned the goods himself and it was the business of the captain or the super-cargo, as the commercial representative was called, to sell the goods to the best advantage. Sometimes they were consigned to one of the great American houses that flourished at that time in China and in the East. If these merchants had waited for orders before shipping their goods there would probably have been no American goods taken to China, Africa and Asia. Through the initiative and enterprise of these New England merchants American cotton goods became widely known in the Eastern countries and American brand names are today household words in the Orient and stand for quality and uniformity.

As the Oriental is conservative and buys the same thing over and over again when he has a good, reliable product, these brand names became of great value and have been copied and imitated by manufacturers in other countries. The difficulty of protecting trade marks in these Eastern countries is very great and a very large part of the cotton goods trade in the Orient has been lost to American mills through the piracies of trade brand names. The remedy is not an easy one to find; perhaps the best one may be similar to the advice of a successful gardener who, when asked how he kept his lawn free from weeds, replied that he kept it so full of grass seed that the weeds had no opportunity to grow. If American merchants wish to retain and increase their trade in the far East they must see to it that Eastern buyers are freely supplied with real American goods under the brand names which are still so widely and favorably known. Our consul general at Constantinople, in the recent report to the State Department, quotes the statement from a member of the American Chamber of Commerce for Turkey which illustrates the difficulties which confront American owners of branded goods:

> The brand "Cabot" is registered in Turkey by the Dwight mills, and the article enjoyed a very large sale years ago, so large, in fact, that today 70 per cent. of the inhabitants of the empire know that Cabot is a name of an American cloth. The name Cabot has been allowed to become a generic term, owing to the fact that both in America and Europe other manufactures have been marked "Cabot." The situation has become so bad that when a gray sheeting is required in Turkey by the Government or private parties it is asked for as American Cabot, but in ninety-five cases out of one hundred the purchaser goes away with an imitation. It is very possible that under the new

regime registered brands would be better protected, provided energetic steps were taken in the courts, for the law is severe if it could be carried out.

Although some of the counterfeit Cabot is shipped from Europe already branded and bearing practically the same marks as the genuine article, a great quantity of the so-called Cabot cloths come into Turkey without any brand at all, and it is here that the marks are put on. It is confidently believed that in some way this could all be stopped, provided the manufacturers in America determined to take the matter up vigorously. If so, millions of yards of American Cabot would be sold in Turkey, and both the Turkish army and the Ottoman people would get an article which would wear.

There is, however, another problem to be faced. It is known that immense quantities of imitation Cabot from Europe, which are marked as pieces of forty yards (the same length as the Cabot) are in reality only thirty-six yards, and the width of the material is in most cases as much as an inch narrower than Cabot.

And further, even if unscrupulous persons were prevented from branding their goods "Cabot," the uneducated country folk would still be deceived, for pieces of cloth have been seen bearing the American Eagle and lettered "Cloth," which is quite good enough for the people who cannot read and who count the letters and find them five, as in Cabot.

There are other circumstances militating against the Americans. European manufacturers have their agent (or several of them) in Turkey whose business it is to canvass the market for orders, sending same to the factory for execution. This agent can sell to nearly every dealer he comes in contact with, provided the manufacturer he represents has a competitive price. The American manufacturer does not appoint an agent, or, if he does, the agent has to put up his money in New York and get out goods for his own account and risk selling to the wholesale dealer here.

With the market already so well established and American brand names so well and favorably known in a country where that means so much, it would seem as if no effort should be spared to retain and increase the business in this field. The benefits of the export trade is clearly demonstrated in the last few months when the sales for China trade have enabled American mills, particularly in the South, to resume activity so long suspended during the summer months.

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The first carding machine in use in the United States was built by Arthur Scholfield, who came from England in 1789 with his brother and went to Byfield, Mass., where they constructed the first carding machine for wool that was operated in the United States.

THE NATIONAL ASSOCIATION OF WOOL MANUFACTURERS

The executive committee of the National Association of Wool Manufacturers decided not to have a banquet and public speaking at Washington or elsewhere this year, but instead to have on the occasion of the annual meeting merely a luncheon for the members of the association and an opportunity for an informal interchange of views. Accordingly the annual meeting of the association was held on February 7 at Young's Hotel, Boston. Luncheon was served at one o'clock, and the reports of the officers and other business followed.

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THE TEXTILE EXHIBITION AN ASSURED SUCCESS

Nearly every foot of space in the entire building has either been allotted or preempted for the Textile Exhibition which is to be held in Mechanics Building, Boston, during the week of April 22nd to 27th. This is the third of these textile exhibitions to be held in Boston under the auspices of the Textile Exhibitors' Association. Each one has marked an advance over the predecessor, and the satisfactory experience of the exhibitors leads them to renew their contracts for space. This year many others who have not previously exhibited, have made reservations, and a good many who have been disappointed in not securing the desired space through their delay.

In connection with the textile exposition will be held for the first time this year a power show. This department will be devoted to everything connected with the use of power as applied to mills and factories. This is bound to prove of great interest, as the power plant is the force behind the successful operation of the machine which turns out the product.

There will also be a department devoted to cement and concrete construction as applied to mill and factory building.

During this exposition it is expected that several thousand master mechanics and commercial engineers will hold their convention in Boston. The National Association

of Cotton Manufacturers holds its convention in connection with the exhibition in one of the halls in the building, and both are mutually benefited, as the exhibition tends to increase the attendance at the manufacturers' convention.

The general public as well as those directly concerned in the manufacture and sale of textiles will be interested in this show because of its comprehensive nature. It differs from so many others, being of a high class, business nature, free from all side shows and cheap fakir features.

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THE CARDED WOOLEN MANUFACTURERS' ASSOCIATION

The third annual meeting of this association was held at the Murray Hill Hotel, New York, on Jan. 18. An informal discussion of the tariff situation showed that this association was firm in its purpose to continue the agitation for an ad valorem tariff on the raw materials of wool manufacture. General satisfaction was expressed over the fact that the Tariff Board in its report on schedule K had unreservedly admitted the justice of the contentions of the Carded Woolen Manufacturers' Association during the past three years. At the same time those present at the meeting were emphatic in their opposition to the plan recommended by the Board to impose a specific duty on the scoured weight of wool. It was pointed out that this would place the heaviest burden on low-priced wools suited for carded woolen goods, and attention was called to the fact that the Tariff Board had made no recommendation regarding wool by-products, which can be used only by the carded woolen process. The following statement was given out after the meeting by Edward Moir, president of the association:

As we want the duty on wool levied on the same basis of value as that of our competitors, the worsted manufacturers, and as the report of the Tariff Board does not afford us the relief we desire, we must continue our fight for an ad valorem duty on wool in order to be consistent. We want only what is just. A good deal of the Tariff Board's statistical work is interesting. Their findings on wool is a confirmation of our position. Even the wool growers have been driven from the position they held, that of assessing a duty on the dirt as well as the wool. They are now in favor of a method whereby the clean contents be ascertained on which a duty of 20 cents shall be levied, irrespective of quality or value.

For obvious reasons this plan is not practicable. Wools suitable for clothing purposes are offered in London and elsewhere at prices ranging from 15 to 70 cents a pound scoured. A duty of 20 cents a pound in these wools would be from 28 per cent. on the fine wools to 1331/3 per cent. on the low wools, or a variation in the rate of over 400 per cent. on value. We have samples of wool offered recently in London, the scoured values of which run from 15 to 70 cents a pound. Among these are Australian merino lambs, worth 70 cents, and these according to the plan suggested by the growers, would have to pay a duty precisely the same as the coarsest varieties, which is manifestly unjust. The adoption of such a method would mean the prohibition of imports of low grade wools and an increased importation of fine wools. In other words, the man who uses low grade wools would have to pay an increased tax on the material he imported, while the spinner of fine yarns would be favored with a reduction of duties.

The weakest thing in the report of the Tariff Board is where they advise specific rates on wool and an ad valorem rate on the finished product.

It has also been suggested that duties be levied on wool according to grade; that is to say, that there be several dividing lines, according to the value. This will never do, as it is too complicated and cannot be administered without friction. Two men might import wools of the same grades, apparently alike in every particular, which when shrinkage tests were made, would show a difference that would place Mr. A.'s wool in one price category and Mr. B.'s in another. Accurate tests cannot be made from small samples, and the different shrinkages that would result might be unjust to one importer and very favorable to another.

An ad valorem duty on grease wool can be collected honestly and successfully, and its adoption would facilitate the work of the customs authorities.

On noils, a by-product of combing, the present duty is 20 cents a pound. Noils can be bought from 8 to 40 cents a pound, so it can be seen readily than an 8-cent noil pays 250 per cent. duty, while a noil costing 40 cents a pound pays only 50 per cent. duty. This shows the inequality of the present law with regard to the by-products used by manufacturers of carded woolens. The Tariff Board, by the way, made no report on by-products.

The election of officers resulted as follows:

President, Edward Moir, of the Crown Mills, Marcellus, N. Y.

Vice-presidents, Gordon Dobson, Pittsfield, Me.; W. A. Dickey, Jr., Oella, Md., and Thomas J. Kitson, Strousberg, Pa.

Treasurer, William Park, Stafford, Conn.

Secretary, Arthur Wheelock, Uxbridge, Mass.

The board of directors: H. J. Hamill, Germantown, Pa.; Robert Bleakie, Boston, Mass.; Mark

D. Ring, Philadelphia, Pa.; Charles P. Bentley, Norwalk, Conn.; Frank Mehling, Cleveland, O.; A. I. Mitchel, Stafford, Conn.; H. J. Niles, Jr., South Bend, Ind.; Ellis Jones, Newport, Me., and John Legg, Worcester, Mass.

THE SOUTHERN NEW ENGLAND TEXTILE CLUB

The January meeting of this club was held at the Narragansett Hotel, Providence, on the 21st. A large number were present and the principal speaker was Franklin W. Hobbs, president of the National Association of Cotton Manufacturers, the subject being "The Manufacturer, His Responsibilities to Stockholders and Operatives." His address was in part as follows:

An investigation that I recently made covering 106 cotton mills, all located in New England, supplied the following facts:

Total capital stock	$135,601,000
Stockholders:	
Men	15,851
Women	14,650
Trustees	5,134
Total	35,635
Employes	148,350

It will be noted that 45 per centum of the stockholders are men, 41 per centum are women, 14 per centum are trustees. In other words, 55 per centum of all the stockholders are women or trustees, and, judging by the average holdings of such investors in several companies, it is believed that their ownership is in excess of the immense sum of $75,000,000 par value of stock, which is owned by or held in trust for women and children dependent to the extent of such investment on its dividends for their livelihood.

In 37 of the 106 companies a majority of the stockholders were women, and in 72 of the companies a majority of the stock was owned by women and trustees. The average holding per stockholder is 38 shares, of a par value of $3.800 only, a great contrast to the existing popular opinion that the ownership is in the hands of a few wealthy people. While these companies do not by any means include all the mills, they are representative concerns, and the same conditions will be found true in all similar corporations. The textile corporations really give large numbers of people a chance to make individually small investments, and in that regard are a great benefit to the community, and should be encouraged in all reasonable ways by local, State and National legislation.

On the other side of the executive stand the operatives, the men and women who actually carry out and execute the ideas and plans he originates, and upon whose skill and loyalty depend the success of the industry. Strangely enough, there has been as much or more misrepresentation about the condition of the operatives as about the stockholders.

Let us now turn from that very unpleasant, but literally true, picture of the conditions that surrounded the domestic system of manufacture and consider the conditions under which the operatives in the textile industry work today. We find them working in large, clean, well-lighted, well-ventilated rooms, amid healthful surroundings, far better than their homes, and, as a matter of fact, the healthiest places they are ever in.

The laws of Massachusetts, which are in many respects the most advanced in the country, require in the public schools 300 cubic feet of air space per pupil, and ventilation furnishing 300 cubic feet of air per minute per pupil. In the latest spinning mill built by the corporation with which I am connected, there are 3,000 cubic feet of air space per operative, and the ventilating system furnishes 50 cubic feet of fresh air per minute per operative—air which is cooled in summer and warmed in winter. You will note that this mill furnishes ten times the space and nearly double the amount of fresh air required by law for our school children. One of our State medical inspectors recently told me that, after many years' experience, he would state unhesitatingly it was a fact beyond a question that the hygienic conditions in many Massachusetts mills are better than those in any school house in the State. And yet there are many well-meaning people, ignorant of the facts, who claim a textile mill is an unhealthy place for men and women to work in! I suggest that our philanthropists and politicians turn their attention for a time to the conditions existing in the homes of operatives, and bring them up to the standard now found in the mills.

It was announced that the next meeting of the club would be held at the Mellen House, Fall River. A rising vote of thanks was extended President Hobbs for his instructive address and the meeting was declared by all to be one of the most enjoyable and profitable yet held.

THE SILK ASSOCIATION OF AMERICA

The fortieth annual banquet of this association was held Feb. 10, 1912, at the Hotel Astor, New York. A large attendance, an array of unusually good speakers, and a menu that left nothing to be desired, combined to make the gathering a complete success. Jerome C. Reed, president of the association, acted as toastmaster, the speakers being as follows:

Hon. Henry F. Lippitt, U. S. Senator from Rhode Island, "Textile Tariffs."

Hon. Joseph W. Fordney, House of Representatives from Michigan, "The Industrial and Commercial Glory of America."

Hon. E. C. Stokes, ex-Governor of New Jersey, "Theoretical Politics."

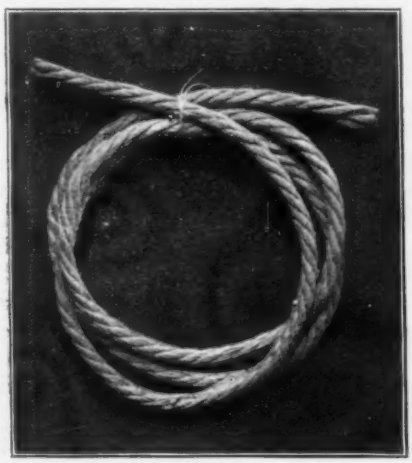
Rev. Nehemiah Boynton, Clinton Avenue Congregational Church, Brooklyn, "The Living Lessons of Lincoln's Life."

Much credit for the success of the occasion is due to the banquet committee, of which the members were M. W. Dippel, chairman; Jos. W. Congdon, Horace B. Cheney, Theodore Boettger and William Skinner.

The Silk Association of America is a working organization and throughout the year is quietly, but efficiently serving the interests of the silk trade. The regular feature of the work, including the collection of trade statistics, is of great value, and the secretary, Ramsay Peugnet, is always ready to give attention to new problems as they arise.

PAPER TWINE FOR TYING FLEECES IN THE ARGENTINE

In the January issue of the Textile World Record, page 500, there appeared a report of a meeting of the International Committee on Vegetable Fiber in Wool, which was held at the offices of Messrs. Dalgety & Co., London. The question of a cheap and suitable pack was the chief point of discussion, and among other things it was finally decided to prepare show cards and cases, giving samples of cloth affected by the jute twine used in South America. These are to be sent to the various barracas and handlers of wool in South America, and also to the colonial warehouses.



FOUR-PLY PAPER TWINE FOR TYING WOOL

A progressive movement on this same line has been inaugurated by Daniel S. Pratt & Co. of Boston, representatives of Engelbert Hardt & Co. of Buenos Aires. Last summer they investigated the various paper twines used for tying fleeces, and finally forwarded to Buenos Aires a sufficient quantity of an excellent 4-ply paper twine to tie several thousand bales. A sample of the twine is shown in the illustration. This twine is being used on their importations this season, and late advices report that it is so far very satisfactory. If pieces of the paper twine are left in the wool, they will disintegrate in the scouring vat and wash away. This firm are the pioneers in the use of the paper fleece twine in the Argentine.

HYGROSCOPIC PROPERTIES OF TEXTILE MATERIALS

In November, 1908, we published the report of an extensive series of tests made by Th. Schloesing fils to determine the hygroscopic properties of textile materials. After the Schloesing tests were completed, one of his pupils, R. Boeswillwald, continued the experiments on hemp and flax with the following results:

Touraine Hemp, Retted and Scutched

Parts Water per 100 parts dry material	Temperature Centigrade	Relative Humidity of the air	Relative Humidity calculated for 24° C.
6.69	34.96	0.292	0.286
	12.05	0.280	
10.01	33.81	0.564	0.537
	13.16	0.507	
16.68	34.00	0.856	0.851
	13.26	0.840	
17.96	34.26	0.894	0.887
	11.36	0.880	
21.72	35.36	0.936	0.929
	11.36	0.921	

Italian Hemp, Retted and Scutched

5.48	34.96	0.286	0.275
	12.05	0.265	

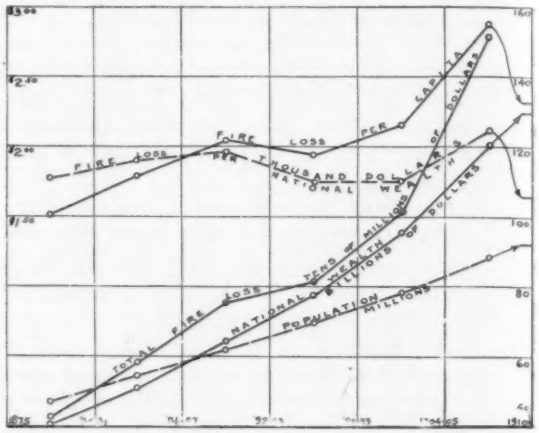
8.40	33.80	0.577	0.565
	13.16	0.544	
12.50	34.11	0.809	0.780
	13.06	0.761	
14.94	35.86	0.870	0.851
	11.36	0.832	
17.20	35.36	0.914	0.903
	11.36	0.892	
	Belgian Flax, Retted in Water		
8.03	24.76	0.386	0.385
10.40	25.31	0.580	0.578
10.70	25.11	0.628	0.626
16.36	24.96	0.858	0.857
18.84	24.96	0.890	0.889
19.21	25.11	0.923	0.921
	Russian Flax, Retted in Water		
10.17	24.76	0.622	0.621
10.22	25.31	0.636	0.634
11.48	24.10	0.694	0.694
16.40	24.96	0.865	0.864
17.18	25.11	0.880	0.878
18.26	24.96	0.929	0.928

THE UNITED STATES OF DESTRUCTION

The chart shows the progress of fire losses, buildings and contents, in the United States during the past thirty-six years. In order to smooth over inequalities due to extreme losses one year and considerably lower ones the next, the chart is based on averages for six years. There are five curves presented, of which the one showing the total fire loss, in tens of millions of dollars, shows the greatest rate of increase at practically every point across the chart. It is growing faster than the national wealth, and very much faster than the population. Both of these facts are seen in the two upper curves showing respectively the fire loss per capita and the fire loss per thousand dollars of national wealth, each of which is now well above the two-dollar mark.

During the thirty-six years covered by the chart, the fire loss in the United States has amounted to $5,120,622,540. This is more than 7 per cent. on the average value of national wealth over this period of time. As a matter of fact, the present annual gain in wealth, which is about $4,600,000,000, represents only the capital at 5 per cent. of our annual fire loss of $230,000,000 per year.

When it is known that over 95 per cent. of all fires in buildings equipped with automatic sprinklers are either completely extinguished by the sprinklers, or held in check for the firemen to finish, being prevented from spreading by the flow of water from the sprinklers, the solution of the problem is


FIRE LOSS PER CAPITA
FIRE LOSS PER THOUSAND DOLLARS NATIONAL WEALTH
TENS OF MILLIONS OF DOLLARS
TOTAL FIRE LOSS
NATIONAL WEALTH BILLIONS OF DOLLARS
POPULATION MILLIONS

seen to be at hand. A sprinklered department store stopped the Baltimore fire. If the building in which this fire started had been properly equipped, there would have been no conflagration to stop.

THE "ONE HUNDRED PER CENT." THROWING METHOD

A plan to improve the method of adjusting silk throwing transactions has been formed by the United States Conditioning and Testing Company, New York. After having been approved by a number of the leading men in the silk industry it was recently submitted to the trade in a circular which illustrated its operation, comparing it with the old plan and stating the advantages the new method offers. It provides for a stable basis for throwing transactions and thus avoids the difficulties arising from the variations under the old method. The explanation of the one hundred per cent. throwing method, as the new plan is called, is given in the circular as follows:

It is the opinion of many of the best informed men in the silk trade that the entire industry would greatly benefit if all throwing transactions were conducted on the basis which is here explained. The "one hundred per cent." throwing method, closely corresponding to what is known in Europe as "La Grande Facon" (equivalent to "the complete working out" or demonstration) is

a method of adjusting the price to be paid for throwing, on a basis which determines the amount of waste made by the throwster for which he is required to pay at the thrown silk price. This method of fixing throwing prices, which ascertains the amount of silk returned, and thus decides the real cost of the thrown silk, has been followed in Europe for many years. Experience has conclusively proved its value.

In settling the price to be paid for the waste, the owner and the throwster must agree on a fair value for the raw silk. As the waste made varies with the character of the silk in each lot, and as market values constantly fluctuate, it follows that throwing prices may vary from time to time. The waste to be figured on each lot is, therefore, also a matter of arrangement. Silks of good quality, on account of the smaller waste made regardless of their better working qualities, should cost less for throwing than inferior silks.

The throwster's price must be sufficiently high to cover the value of the waste expected in throwing. To determine the exact amount of waste made, four facts are necessary; the conditioned weight of the raw silk, the conditioned weight of the thrown silk, the per cent. of boil-off of raw silk, and the per cent. of boil-off of the thrown silk. All of the silk, both before and after throwing, must therefore be sent to the conditioning house for testing. The throwster's charge is made on the conditioned weight of the raw silk.

The following illustrations are presented to show the difference in the method of figuring the throwing charges by the old method, by the "one hundred per cent." method, and by "La Grande Facon" adjustment. It is assumed that 2 1/2 per cent. of waste in throwing will be made. The throwster is not charged with the weight of the raw boil-off sample, as this is not sent to him. For the purpose of comparing the illustrations given, the weight of the test sample has also been deducted in example A. Modifications of the raw silk prices, due to the terms of sale, have been purposely omitted, though this may be figured if desired.

OLD METHOD

Example A:—Basis—Japan raw silk, for organzine invoice weight 102.22 pounds.

Price $4.00 per pound conditioned weight, equal to $3.92156 per pound invoice weight.

The invoice weight is assumed to be 2 per cent. in excess of the conditioned weight. Price for throwing, 65 cents per pound on invoice weight. Throwster's bill will therefore be:

102.22 pounds at 65 cents, equals	$66.44
Deduct raw boil-off sample .22 pounds at 65 cents, equals	.14
	$66.30

This deduction is made to bring the examples of the throwster's bills, A and B, to the same basis, since the sample is not sent to the throwster when silk is conditioned.

ONE HUNDRED PER CENT. METHOD

	lbs.	
Price of raw silk at $4.00 per pound, conditioned weight; 102.22 pounds, reduced to conditioned weight, equals	100.22	
Deduct raw boil-off sample	.22	
Silk sent to throwster, conditioned weight, raw	100.00	
Raw boil-off, 18.40 per cent.	18.40	
Conditioned fiber weight of raw silk		81.60
Silk returned by throwster, conditioned weight thrown	103.00	
Thrown boil-off, 22.76 per cent.	23.44	
Conditioned fiber weight of thrown silk		79.56
Waste, conditioned fiber weight		2.04

The figures used in examples are for demonstration purposes only.

To bring the weight of the conditioned fiber waste to its weight as conditioned raw silk, divide the number of pounds of the fiber waste by 1.00 minus the percentage of the boil-off in the raw, 18.40 per cent. (.1840) in this case, leaving .8160 as the divisor: 2.04 pounds divided by .8160, equals 2.50 pounds, which divided by the total conditioned raw silk weight, 100 pounds, shows a waste of 2 1/2 per cent. The same result is arrived at if the calculation is made on the conditioned fiber weight without reducing it to conditioned raw weight. Thus, conditioned fiber weight of waste made, 2.04 pounds divided by the total fiber weight of the raw silk, 81.60 pounds, again shows a waste of 2 1/2 per cent.

The throwing price under the old method being 65 cents, and the throwster having estimated that the waste made in throwing will be 2 1/2 per cent. and having agreed upon the raw silk price conditioned weight at $4 per pound, a throwing price on the 100 per cent. method is figured according to the following formula: To the raw silk price, conditioned weight, add the throwing price conditioned weight, divide this sum by 1.00 less estimated per cent. of waste; from this subtract the raw silk price conditioned weight; result is throwing price One Hundred Per Cent. Method.

On the New York market raw silks are sold actual weight, or invoice weight, or conditioned weight. Japan silks, China steam filatures and Canton filatures are also sold conditioned weight, plus 2 per cent., and China rereels and Canton rereels, plus 2 1/2 per cent.

Under the rules and regulations to govern transactions in the silk trade of the United States, approved by the Silk Association of America and amended Aug. 9, 1911, all silks may now be sold conditioned weight without any percentage of regain over the usual 11 per cent. added to the absolute dry weight.

Demonstration

Estimated weight, 2 1/2 per cent.	
Raw silk price, conditioned weight	$4.00
Throwing price, conditioned weight	.663
	$4.663
$1.00, less 2 per cent. estimated waste, equals	.975

$4.663 divided by .975 equals $4.7825
Subtract raw silk price, conditioned weight 4.00

The throwing price $0.7825

making the cost in this instance by One Hundred Per Cent. Method, on the conditioned weight basis, a sum of $0.1325 in excess of the former price of 65 cents on invoice weight.

The throwster now makes his charge as follows:

THROWSTER'S BILL ON ONE HUNDRED PER CENT. METHOD

Example B

100 pounds at $0.7825 equals			$78.25
Less 2 1/2 pounds waste at for silk	$4.00	$10.00	
Less 2 1/2 pounds at for throwing	.7825	1.95	
Less 2 1/2 pounds at for thrown silk	4.7825		11.95
Making total charged by throwster			$66.30

This is exactly the same charge as shown in example A after the weight of the sample has been deducted. Thus at an agreed price of $4 for raw silk, with the throwing price by the old method at 65 cents, allowing 2 1/2 per cent. for waste, the equivalent price for throwing on the One Hundred Per Cent. basis is practically 78 cents.

The advantages of the One Hundred Per Cent. throwing can be summarized as follows: 1. The cost per pound of the thrown silk is known definitely in advance, after deducting raw boil-off samples, since the throwster pays for all the waste, allowance for which is included in the increased price for throwing. 2. The weights of the raw and thrown silk and the loss by boiling-off are definitely known, instead of being estimated or assumed, giving the clearance a mathematical accuracy obtainable in no other way. 3. The use of this method tends to produce a minimum of waste, as a direct loss to the throwster is the result of any waste made in excess of amount stipulated. 4. Both the owner and throwster proceed on a known basis regarding the weight of the silk at all stages where the weight is affected, and both parties are on a mutually understood basis where their respective rights can be accurately determined by mathematical processes. 5. The conditioned weight and boil-off of the thrown silk being known, the manufacturer is able to order his weightings with greater precision. 6. It is practically a scientific demonstration as compared with doubtful estimates.

Below are given some examples from actual tests of both raw and thrown silk, all five bale lots, combination tests, as made by the United States Conditioning & Testing Company:

	Raw		Thrown		
Stock.	Cond. weight. lbs.	Boil-off.	Cond. weight. lbs.	Boil-off.	Waste.
Japan	677.97	18.56%	692.79	20.48%	0.22%
Japan	670.98	18.19%	693.70	21.53%	0.83%
Japan	670.40	18.36%	692.27	21.80%	1.09%
Japan	687.46	19.70%	699.81	22.25%	1.44%
Japan	693.28	18.69%	715.32	22.68%	1.88%
Japan	634.86	19.12%	651.95	23.18%	2.46%
Japan	680.81	18.24%	691.34	22.18%	3.35%
Japan	652.36	17.26%	659.81	21.49%	4.03%
China	665.30	16.93%	685.18	20.55%	1.50%
China	553.52	17.34%	547.80	21.55%	2.67%
China	661.34	16.71%	670.23	20.39%	3.13%
China	658.51	17.76%	661.45	22.07%	5.61%

It is proper to state that since the waste made in throwing is not known until the work is done, and the price for throwing has to be quoted in advance, there is room for difference of opinion between the parties as to what waste should be figured on each lot. Some chance must be taken in the matter, and experience gained in practice will form a very safe guide.

LA GRANDE FACON

A method of applying La Grande Facon principles, as used in Europe, may be stated as follows: The manufacturer and throwster agree upon a certain per cent. of waste, the throwster paying the manufacturer for any excess waste that may be made, and under reversed conditions the manufacturer paying the throwster for saving any waste below the estimated per cent. This is on the principle that if the throwster expends extra labor to diminish waste he should be compensated for it.

The following example will show an adjustment by the European method: Basis—Silk sent to throwster conditioned weight, raw 100.00 pounds; price for throwing, conditioned weight, 65 cents per pound; value of raw silk, conditioned weight, $4.00 per pound; allowance for waste, 2 1/2 per cent.

Demonstration:

	Pounds.	
Throwing charge, 100.00 pounds, conditioned weight, at 65 cents, equals		$65.00
2 1/2 per cent. waste allowance on 100.00 pounds, equals	2.50	
Actual waste, conditioned weight	1.25	
Saving in waste	1.25	
at $4.00 raw silk		5.00
Total amount received by throwster ...		$70.00

To apply this method under the customs prevailing in America it is necessary to include the throwing cost in the price paid for the waste, and to add 2 per cent. to the total to bring it to the conditioned weight plus 2 per cent—

Thus: 100.00 pounds conditioned weight at 65 cents, equals		$65.00
Waste saved, 1.25 pounds raw silk at $4.00		
Throwing	.65	
	$4.65—	5.81
		$70.81
Plus 2 per cent.		1.41
On this basis the throwster receives ...		$72.22

In cases where the waste made is 2 1/2 per cent., being the actual amount agreed upon, the throwster's charge on 100 pounds, conditioned weight, multiplied by 65 cents, equals $65.00, plus two per cent., $1.30, making a total of $66.30, exactly the same as examples A and B. The application of this method does not require any preliminary calculation of the throwing price. Under either the One Hundred Per Cent. or La Grande Facon method of adjustment, the amount paid to the throwster will vary with the quantity of actual waste made, the throwster paying the manufacturer for any excess waste, while under reversed conditions the manufacturer pays the throwster for the saving of any waste below the estimated percentage.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

THAT FIRST OVERSEER'S POSITION

BY COLFAX

(Continued from December.)

On making a full examination of the wrecked finisher I found to begin with that three rings on the top doffer and two on the bottom one right in the center were jammed to the leather, about a half inch in width. The fancy had been thrown in such a way that it hung over the condenser with one end of its shaft still in the box on the worker belt side of the card, being held in on account of a cap which screws it in, although the box itself was twisted sideways and the other end of the fancy had landed and was resting on a large brass knob which usually adorns the rub-roll style of condenser. This knob left a beautiful dent in the fancy wire.

All the workers had been thrown out, some on the floor, some on the Apperly feed and all more or less jammed up. The tumbler shaft was sprung, the clothing jammed, the cylinder had a great streak half way around and a couple of sheets loosened. One fancy stand was broken off and several of the worker pulleys broken.

Now the cylinder was covered with No. 35 iron wire, as were also several of the workers and the tumblers, and as I was pretty good at fixing up wire I was not worried much about them, but I was troubled about the new steel wire rings, as I realized it would be a nice job to send off for new ones to replace those damaged, as I might and might not get a good match and in any case it would probably take several weeks and a long, careful grinding after I had them on the doffer again.

I therefore decided to see what I could do about repairing the damaged rings myself, so took off the necessary number to get at the damaged ones, then pulled out the wire carefully where it was jammed, being very careful not to injure the holes in the leather. Then I took one of the wide waste wings and pulled out some of the wire in that and carefully put this wire back into the space where the damaged wire had been pulled out.

This was extremely delicate work, required patience and took time, but after I had filled in the damaged space in one of the rings and examined its condition, I found that it was impossible to notice on the wire that any damage had been done, and this gave me a lot of encouragement to continue the tedious work until I had all the damaged rings filled in and in perfect order again. In pulling wire from the waste rings I had taken a few here and there all around so that it made no impression on the usefulness of these.

I was probably two days getting the rings into shape and in the meantime my only requisition for new material was to send to the foundry for new castings to replace the broken ones. After getting the doffers into shape so I could grind them lightly I then got busy on the cylinder, fixed that up in fine shape and put the grinder on it and by this time the rings were in condition to put into the card and then while the cylinder was grinding I took up the workers, strippers tnd tumblers and to be brief, in a week from the day of the accident, the card was running again and it is probable I could have accomplished the work in a shorter time, but I was extremely careful to have everything just right. I was particularly proud of the job I did on the rings as it was absolutely

impossible to notice in any way where the damage had been done.

Both the agent and superintendent complimented me on the way I had handled the whole thing, and during the three and one-half years that I remained with them this was the only accident of this kind that happened.

THE EFFECT OF MOISTURE ON THE STRENGTH AND ELONGATION OF YARNS AND FABRICS

By Prof. Aldred F. Barker, F. W. Barbrich, and F. Pickles.

A substance capable of absorbing moisture may have its physical characteristics considerably modified by a variation in the amount of moisture present in it, this modification being more or less marked according to the hygroscopicity of the substance, that is, the power which it has of absorbing and retaining water.

All textile fibers, whether of animal or vegetable origin, in their normal conditions, contain a certain percentage of natural moisture, which varies with different materials, but it is found to remain constant when several samples of the same material are tested under identical conditions of temperature, humidity, etc.

The actual amount of moisture present in a fiber is governed by three factors: 1, the normal amount which is contained by the fiber under ordinary circumstances; 2, the atmospheric conditions prevailing at the time; 3, the capacity of the fiber for holding an additional amount of water, which may be derived from a damp atmosphere, or which may be added by artificial means. When a fiber is exposed in a moist atmosphere it will be found to absorb additional moisture and increase in weight, whereas if it is exposed in a dry atmosphere, it will lose moisture and decrease in weight.

It has been found that the strength and elongation of textile fabrics are greatly influenced by the variation in their moisture content. The extent of this influence may be readily realized from the following results, which were obtained on testing the strength and elongation of a worsted serge fabric in as nearly as possible an "absolutely dry" condition, and again when saturated with moisture.

In state of	Strength	Elongation
"absolute dryness"	lbs. 97.5	in. 1.44
saturation	lbs. 72.8	in. 3.14

or, expressed in percentages

"absolute dryness"	100	100
saturation	74.7	218.3

A flax canvas tested under precisely similar conditions gives an equally marked result, but in this case, in a cloth which has been saturated with moisture, both increased strength and elongation are obtained.

Further tests were carried out on cotton and worsted cloths. Patterns of the two cloths were prepared for testing and half of each set of patterns were deposited in a room where the humidity was 92 per cent. and the remainder deposited in a room where the humidity was 76 per cent. The patterns were allowed to remain three days before they were tested. The average of the results are given below:

Cotton Cloth

At 92% humidity		At 76% humidity	
Strength	Elongation	Strength	Elongation
133.3 lbs.	.44 in.	123.9 lbs.	.38 in.

Worsted Cloth

At 92% humidity		At 76% humidity	
Strength	Elongation	Strength	Elongation
230.1 lbs.	3.34 in.	241.6 lbs.	3.17 in.

An extensive series of tests have been carried out with a view to determining the extent of the influence of moisture on the strength and elongation of wool, cotton, and mixed or union fabrics, and the results of these tests are embodied in the following article.

Preparation of the Fabric for Testing.

Prior to testing the effect of moisture on the strength and elongation of the wool, cotton, and mixed fabrics, certain preliminary investigations were carried out, these included: (a), a comparison of the results obtained by testing patterns prepared in different ways; (b), a comparison of the results recorded by different strength-testing machines; (c), the determination of the percentages of wool and cotton in the "Alaska," or mixed fabric used, and the effect of em-

ploying solutions of varying strengths in dissolving the wool and carbonizing the cotton.

In order to obtain absolutely reliable results in testing the strength of fabrics, it is essential that the same methods of procedure should be followed, and the identical conditions should prevail throughout a series of tests. Experiments have shown that slight differences in the method of cutting the patterns and in setting the testing machine, prior to making the tests, have a marked influence on the results obtained.

In preparing patterns for testing, two methods may be adopted (1) the fabric may be torn into strips of exactly the required dimensions, or, (2) they may be torn or cut into strips larger than the standard size for testing and the threads afterwards pulled-out until the standard size is reached. In testing milled cloths, it may be found advisable to tear the patterns to the required size, since considerable difficulty is experienced in pulling-out the felted or matted threads. Generally speaking, however, the patterns should be cut larger than required, and the necessary number of threads removed. Where possible, the actual number of threads remaining should be counted, so that any variation in the number of threads and picks per inch may be recognized as such, and not be erroneously recorded as a difference in the actual strength of the material composing the fabric. With regard to the variation in results obtained by the use of the two methods just indicated, the following comparative results are of interest.

Type of Pattern:—Milled cloth, worsted warp, woolen weft.

1—Cloth torn to size

Strength		Elongation at Breaking Point
103.1 lbs.	warp test	2.13 in.
106.5 lbs.	weft test	2.2 in.

2—Cloth cut too large and threads removed until standard size is reached

Strength		Elongation at Breaking Point
100.5 lbs.	warp test	2.15 in.
117.6 lbs.	weft test	2.29 in.

Conclusions.

Warp test. Beyond a normal variation, no appreciable difference is noticed in (1) and (2), in either the strength or the elongation of the warp.

Weft test. These results show that the weft is 10 per cent. stronger when prepared according to (2). A scarcely appreciable difference (4.4 per cent.), is noticed in the elongation.

In order to ensure uniform results, all strength and elongation tests were carried out on one machine—of standard type—which was electrically driven at a speed of 30 revolutions per minute.

Results Obtained on Different Machines.

Where more than one testing machine is available, it is necessary, in carrying out a series of experiments, to test all the patterns on the same machine, since a marked discrepancy may arise when results intended for comparison have been obtained on two machines. A number of tests have been carried out in order to determine the discrepancy in results obtained on comparing the strength of a fabric tested on several machines. This discrepancy is to be considered as being caused by mechanical defects in the machines, since it is found to occur when standard-sized patterns of the same fabric are tested.

The machines on which the tests were made were of uniform type and precisely similar conditions prevailed at the time of making the tests. The following results were obtained—100 being taken as representing the average strength recorded by the first, or standard machine:

Average Strength.

No. 1 machine	100
No. 2 machine	97
No. 3 machine	95
No. 4 machine	97

It will be noticed from these results that the standard machine gives a stronger result than the other three machines, although the decrease in strength is only 5 per cent., which is recorded on machine No. 3.

Determination of Wool and Cotton in Mixed Fabrics.

The "Alaska" cloth was found to contain 60 per cent. of cotton and 40 per cent. of wool. The method of determining these percentages was as follows. A sample of the cloth was first weighed, and then dried

at 212° to 221° F. until a constant weight was obtained. By this means, the natural amount of moisture in the sample was ascertained. The cloth was next boiled in a 2 1/2 per cent. solution of caustic soda (NaOH) for 20 minutes and the wool dissolved, the remaining cotton was then dried and weighed as before. From the difference between these two weighings, the percentages of wool and cotton were determined. Since the "standard normal amount of moisture" is 18.25 per cent. in wool, and 8.5 per cent. in cotton, it is necessary that all calculations should be based on the "absolute dry weight" of the material, or inaccurate results would be obtained.

In order to check the percentages obtained by the above method of analysis, the cotton was removed from the wool by carbonization in the following manner. A sample of the material was dried and weighed, as in the previous determination, and then submitted to the action of a 5 per cent. solution of sulphuric acid at ordinary temperature for half an hour. The sample was then dried, without washing, and the carbonized cotton was removed by beating and shaking. In submitting the sample to the action of the sulphuric acid, the acid is concentrated on the wool as well as on the cotton, consequently when the carbonized cotton has been beaten out of the sample it is necessary to remove the sulphuric acid from the wool. This is effected by washing in warm water at 95° to 104° F. and then in warm water with a little soap added. The residual wool was afterwards dried and weighed and the percentages calculated as in the previous determination.

Another method of determining the percentage of cotton and wool is by boiling the cloth in a 10 per cent. solution of caustic potash (KHO) for seven minutes (absolute dryness having been first obtained as before) and dissolving the wool, the cotton residue being then dried, weighed, and the percentages of each calculated on the first dry weight. An addition of 2 per cent. should be added to the cotton owing to the loss in weight sustained by the action of the alkali on the cotton. In order to determine the loss in weight of the cotton due to treatment in a solution of caustic soda at 212° F., a number of experiments were conducted with samples of cotton treated with solutions of boiling caustic soda of various strengths. The following results were obtained:

Percentage NaOH solution	Percentage loss
1.0	1.25
2.5	2.00
5.0	2.75

A 1 per cent. solution is the weakest solution that will effectually dissolve the wool.

From these results, it is evident that whenever cotton is submitted to the action of boiling caustic soda, a considerable loss in weight occurs, so that, in dissolving the wool, in a wool and cotton mixed fabric, a certain loss in weight is sustained by the cotton. In order to correct this, the "percentage loss" indicated above should be taken into account and the necessary allowance made, according to the strength of the alkali used.

In a similar manner, wool was found to be affected by dilute sulphuric acid, a number of samples of wool were treated with dilute sulphuric acid of various strengths, at ordinary temperature, and the following results were obtained:

Percentage H_2SO_4 solution	Percentage loss
1.0	1.0
2.5	1.5
5.0	2.0

A 1 per cent. solution of sulphuric acid will carbonize the cotton, but a 5 per cent. solution is to be preferred, since a much shorter time is required for complete carbonization.

TESTING OF PATTERNS WITH VARYING PERCENTAGES OF MOISTURE

In order to determine the effect of moisture on the strength and elongation of fabrics, it was necessary to make a series of tests on strips of fabric of a standard quality containing various percentages of moisture. The fabrics were prepared by hanging them in a closed chamber in which trays of water were placed, or, where a high percentage of moisture was required, the patterns were suspended between, but not in contact with, wet cloths. For patterns which were tested in a saturated condition, it was necessary to immerse them in water and then wring out the superfluous moisture.

(To be continued.)

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

PRINTING WORSTED BY THE VIGOUREUX PROCESS

[Translated from the French by the Editor of the Textile World Record.]

By SIMON VIAL in Le Monde Industriel

The dyeing of wool by the vigoureux printing process has enabled spinners to obtain results that were not possible by any other process. The principle of the vigoureux process is to print on the sliver the shades needed to produce the desired mixture in the yarn. It consists of three operations: 1, printing of the sliver; 2, fixing of the dye; 3, rinsing of the sliver.

Printing of the Sliver. This operation, the most important of the process, is performed by a machine which prints the slivers transversally, so that the fibers are printed at intervals with the shades required to produce the mixed effect desired. The printing machine is in reality a special printing gill-box. The gill-box serves to bring the fibers parallel with each other. It consists of two sets of rollers, the first receiving the wool and delivering it to a series of combs consisting of pins set in metal bars which move forward, thus combing the fiber and carrying the sliver to the second set of rollers which turn more rapidly and draw the material over the needles. The last set of rollers, which like the first are corrugated, are run under pressure, the bottom roller carrying an endless apron. From the last set of rollers the sliver is wound on bobbins. Each machine is fed with 4, 6 or 8 slivers which are spread uniformly over the width of the feed rollers. The draft between the two sets of rollers varies from 4 to 6. The gill-box used in connection with the vigoureux process is equipped with heavy fallers in front of which the printing rolls are placed.

The printing solution is placed in a wood tank and in this solution the distributing roller runs, the depth of immersion being made by screws. The distributing roller is cast iron covered with rubber. This roller deposits the printing solution on another roller, also of cast iron and covered with rubber. The sliver runs over the last named roller, above which is the printing roll made of copper and engraved to give the effect desired. Pressure on the printing roll is obtained by levers and springs. The raised portion of the roller prints the dye on the sliver. The sliver when coming from the delivery rolls of the gill-boxes passes over a spreader which converts it into a ribbon about 18 inches wide. After being printed the sliver passes over reels and is folded mechanically or by hand on a table. As it is necessary to have a regular feed to the printing gill-box, the sliver is usually fed from balls set in a rack having corrugated rolls driven by gearing, thus ensuring a uniform delivery of the material. After being printed the sliver is steamed to fix the color on the fibers. This is done by placing the material in a kier and subjecting it to a pressure of 8 to 15 pounds per square inch for about an hour.

Washing the Printed Sliver. After steaming, the sliver is rinsed to remove the surplus dye, this being done in a backwashing machine which usually has five bowls each equipped with two sets of squeeze rollers, one at each end and by which the sliver is carried from one bowl to the next one. The bowls are connected with each other by pipes and valves, enabling the liquor to be carried from one to the other. Each bowl also has a waste pipe. The liquor in the first bowl is prepared with carbonate of soda or other alkalies, heated to 80° F. The second and third bowls are used for rinsing the water, being heated to 90° F. The fourth bowl contains a soap solution heated to a temperature slightly above that of the preceding bowls. The fifth bowl contains a somewhat stronger soap solution. After passing through these five bowls the sliver is dried by being carried over cast iron rollers heated from the interior by steam at a pres-

sure of 90 pounds. Above these rollers are hollow copper rolls driven by gears, heated by steam and drying the material by radiation. The two sides of the sliver are thus alternately exposed to the heat and brought in contact with the drying rolls. After being dried the material is run through an ordinary gill-box. The gill-box on the backwasher mixes the colors only slightly and in order to get the shades thoroughly mixed the sliver is run through a mixing gill-box which changes completely the appearance of the material.

The Piel mixing gill-box ordinarily handles twenty-four slivers, weighing 280 grains to the yard, these being drawn to one sliver. The mixing gill-box is in fact a double gill-box. The six feeding heads are of ordinary constructions, but the two delivery heads which are run very rapidly are of a new form patented by M. Piel. The faller used in the Piel system has the needles slanting toward the drawing rolls, an arrangement that offers important advantages as to both the quality and quantity of the production. Among other things it enables the groove in the faller to be dispensed with. This groove is necessary in the old style fallers in order to guide them properly when rising and falling, but they weaken the faller considerably at the place where they receive the stroke of the cam and require the greatest strength. Guided by the edges, the new faller is controlled without grooves when rising and falling. The spring and plate which serve as a cushion being no longer in the way, the needles operate close to the drawing rolls. There is between the rollers and the fallers a considerable space which enables the strength of the cams to be increased four-fold, making them unbreakable. It is also possible to strengthen the rollers, whereas under the old system certain parts were often weakened in the attempt to bring the pins close to the nip of the drawing rolls. When operated at a high speed the ordinary rollers are liable to become broken by torsion. The use of the Piel screw and fallers enables the gill-box to be run at a very high speed. A new winder has also been invented for this machine. Even if the speed of the machine is not increased, the Piel construction offers important advantages by reason of the increased solidity. The slivers from the Piel machine are very uniform and in good condition for the subsequent processes.

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A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

BROKEN TWILLS

These are twills in which the twill line is broken at intervals by offsetting the float. In balanced twills the risers of the first thread of a group are usually, but not necessarily, brought opposite the sinkers of the last thread of the preceding group.

The intermittent drawing-in draft is required for these effects. The break may be in either or both directions (warp and filling). The direction of the twill may be reversed at intervals, if desired. Examples of broken twills are shown at Figs. 420 to 454.

The following are broken in the warp:

Fig. 420, twill $^{1}\!-\!_{3}$ divided 2 and 2.

Fig. 421, twill $^{2}\!-\!_{2}$ divided 2 and 2.

Fig. 422, twill $^{2}\!-\!_{2}$ divided 4 and 4.

Fig. 423, twill $^{3}\!-\!_{3}$ divided 6 and 6.

Fig. 424, twill $^{4}\!-\!_{4}$ divided 2 and 2.

Fig. 425, twill $^{6}\!-\!_{2}$ divided 2 and 2.

Fig. 426, twill $^{6}\!-\!_{3}$ divided 2 and 2.

Fig. 427, twill $^{4}\!-\!_{2}\!-\!^{2}\!-\!_{4}$ divided 12 and 12.

Fig. 428, twill $^{4}\!-\!_{4}$ divided 6 and 2.

Fig. 429, twill $^{2}\!-\!_{1}\!-\!^{1}\!-\!_{3}$ divided 4 and 4.

Fig. 430, twill $^{5}\!-\!_{1}\!-\!^{2}\!-\!_{3}\!-\!^{1}\!-\!_{3}$ divided 3 and 3.

Fig. 431, twill $^{4}\!-\!_{4}$ divided 3 and 3 twill reversed.

Fig. 432, twill $^{1}\!-\!_{4}\!-\!^{1}\!-\!_{1}\!-\!^{4}\!-\!_{1}$ divided 3 and 3.

Fig. 433, twill $^{4}\!-\!_{2}\!-\!^{2}\!-\!_{4}\!-\!^{2}\!-\!_{2}$ divided 5 and 5.

Fig. 434, twill $^{5}\!-\!_{3}\!-\!^{1}\!-\!_{3}$ divided 1 and 1.

The following are broken in the filling:

Fig. 435, twill $^{3}\!-\!_{3}$ divided 4 and 4.

Fig. 436, twill $^{4}\!-\!_{1}\!-\!^{2}\!-\!_{3}$ divided 4 and 4.

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FIG 420.

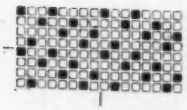


FIG 421.

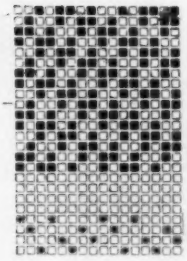


FIG. 422.

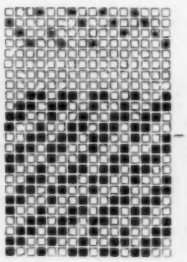
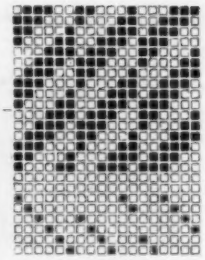


FIG. 423.



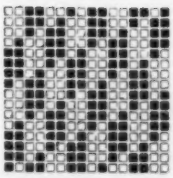


FIG. 424.

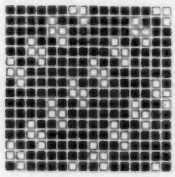


FIG. 425.

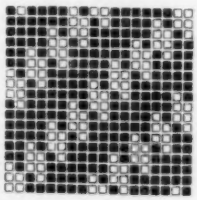


FIG. 426.

Fig. 437, twill $^{2}/_{2}$ divided 4 and 4, twill reversed.

By the arrangement shown at Fig. 435 the twill is started at the same place at the be-

FIG. 427

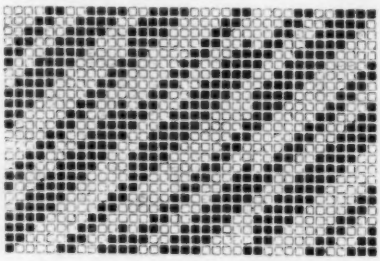
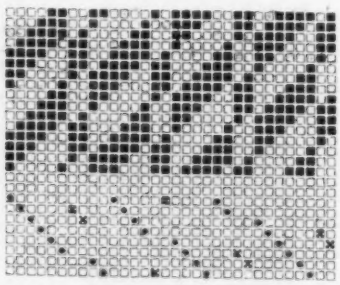


FIG. 428.



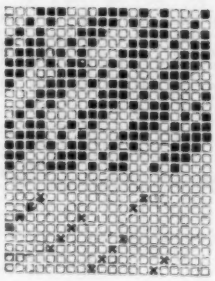


FIG. 429.

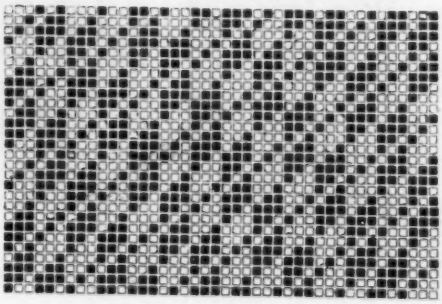


FIG. 430.

ginning of each group of 4 threads. This causes a longitudinal groove effect which is very attractive in fine worsted fabrics.

Fig. 440, twill $^{3}—_{3}$ divided 9 and 2.
Fig. 441, twill $^{2}—_{2}$ divided 6 and 2.
Fig. 442, twill $^{3}—_{3}$ divided 18, 2, 6, 2.

FIG. 431.

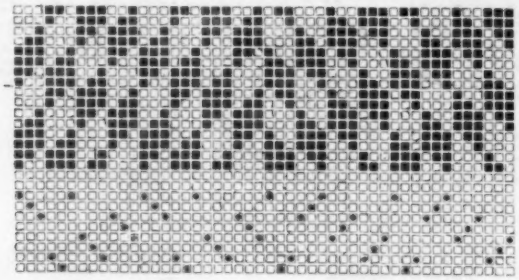
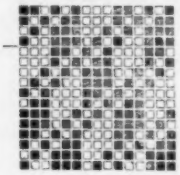


FIG. 432.



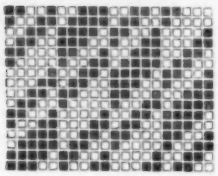


FIG 433.

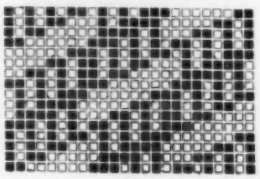


FIG. 434.

FIG. 438.

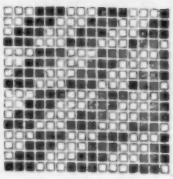
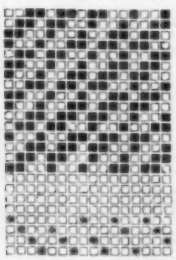
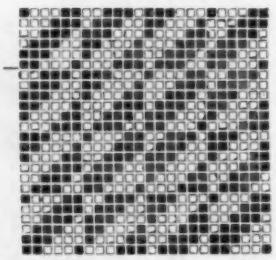
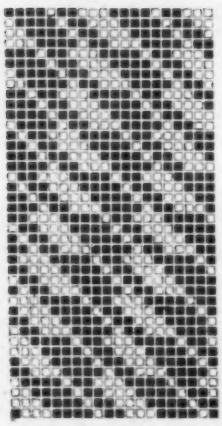


FIG. 435.

FIG. 439.







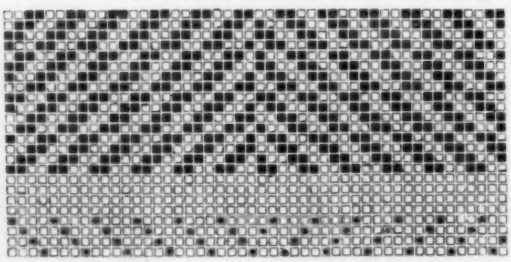


FIG. 436.

FIG. 437.

The following are broken in each direction, warp and filling:

Fig. 438, twill $^{2}—_{2}$ divided 4 and 4.
Fig. 439, twill $^{3}—_{3}$ divided 6 and 6.
Fig. 443, twill $^{3}—_{3}$ divided 14, 2, 14, 2, 2, 2.
Fig. 444, twill $^{2}—_{2}$ divided 4 and 4 twill reversed.
Fig. 445, twill $^{4}—_{4}$ divided 4 and 4.

Fig. 446, twill $^{1}\!-\!_{1}\!-\!^{2}\!-\!_{1}\!-\!^{1}\!-\!_{2}$ divided 8 and 8.

Various fanciful patterns made by breaking the twill in both warp and filling are shown in Figs. 447 to 454.

Fig. 447, pattern 24 warp, 24 filling threads.

FIG. 440.

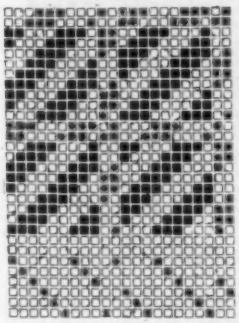


FIG. 441.

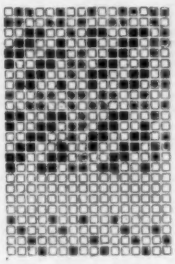
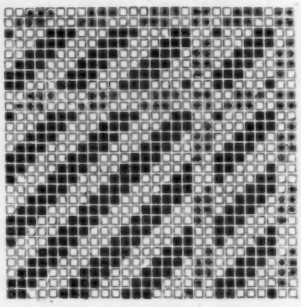


FIG. 442.



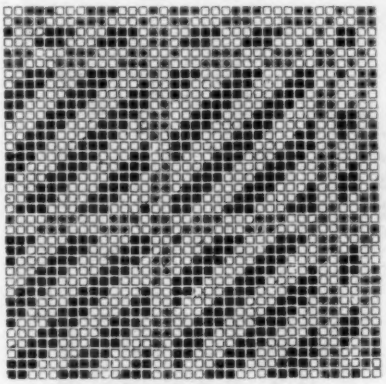


FIG. 443.

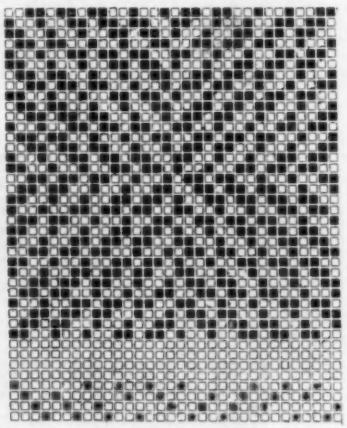


FIG. 444.

Fig. 448, pattern 14 warp, 14 filling threads.

Fig. 449, pattern 16 warp, 24 filling threads.

Fig. 450, pattern 15 warp, 20 filling threads.

Fig. 451, pattern 32 warp, 32 filling threads.

Fig. 452, pattern 32 warp, 16 filling threads.

Fig. 453, pattern 40 warp, 40 filling threads.

Fig. 454, pattern 80 warp, 16 filling threads.

CORKSCREW TWILLS (DIAGONAL RIBS)

These weaves require the manifold (No. 6) form of drawing-in drafts, Figs. 20, 21 and 22. The peculiar features of corkscrew weaves is the combination of two or more distinct twill lines, which are independent of each other and may be of different colors.

Corkscrew fabrics, which are usually made of fine worsted, should be set close in the warp, otherwise the twill will look thin and ragged. Various examples of corkscrew weaves are given at Figs. 455 to 509.

Fig. 455, 8 shaft, 2 twills.

Fig. 456, 7 shaft, 2 twills.
Fig. 457, 9 shaft, 2 twills.

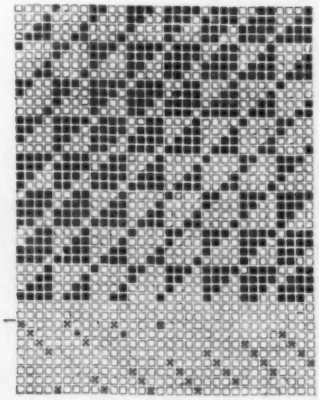


FIG. 445.

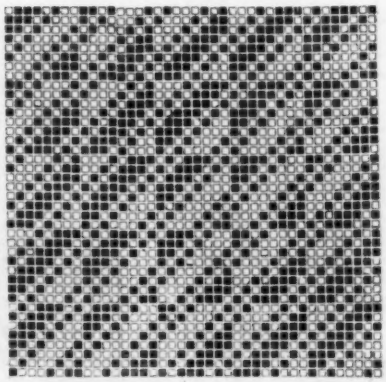


FIG 446.

Fig. 458, 11 shaft, $^{6}\!-\!_{2}\!-\!^{1}\!-\!_{2}$, 2 twills.
Fig. 459, 13 shaft, 2 twills.
Fig. 460, 15 shaft, 2 twills.
Fig. 461, 14 shaft, $^{5}\!-\!_{4}\!-\!^{3}\!-\!_{4}$, 3 twills.

floats on the back of the cloth. Corkscrew twills can be reversed, deflected or made in wavelike or undulating form, as shown by Figs. 463, 464 and 465.

Fig. 463, 36 warp, 24 filling threads, twill deflected.

FIG. 447.

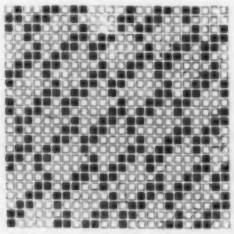


FIG. 448.

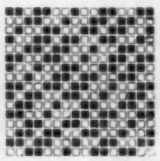
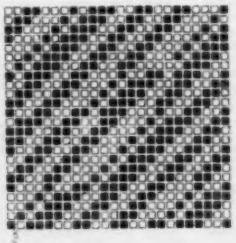


FIG. 449.



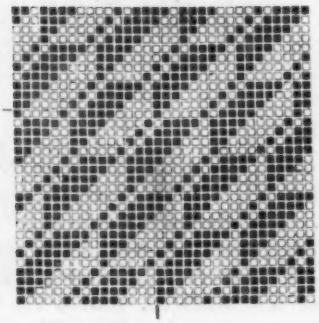


FIG. 450.

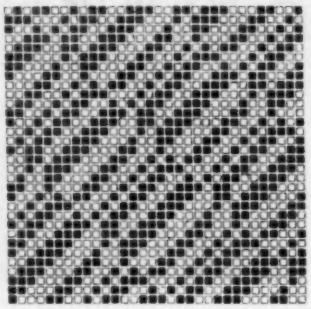


FIG. 451.

Fig. 462, 17 shaft, 2 twills.

The single points (risers) in Figs. 458, 460, 461 and 462, are introduced to stitch the

Fig. 464, 9 shafts, twill $^{5}\!-\!_{4}$, twill reversed.
Fig. 465, 13 shafts, twill $^{7}\!-\!_{6}$, twill deflected.

FIG. 452

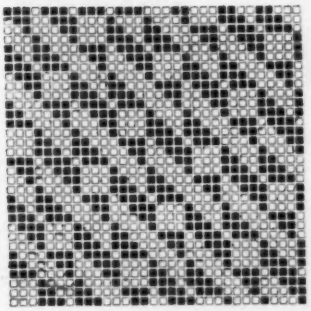
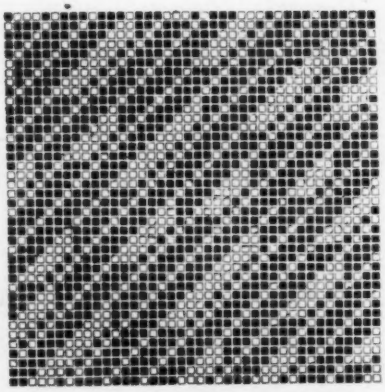


FIG. 453.



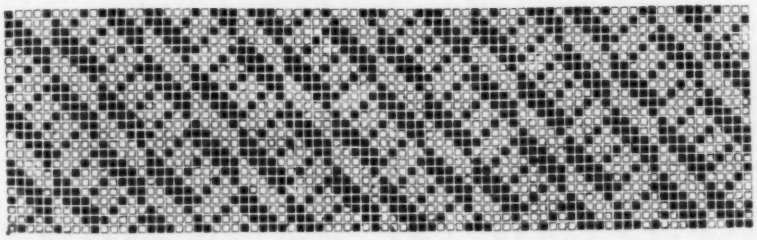


FIG. 454.

FIG. 472.

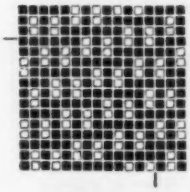


FIG. 473.

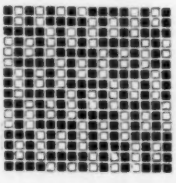


FIG. 474.

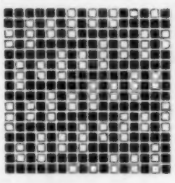
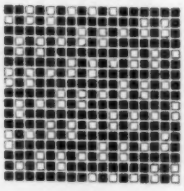
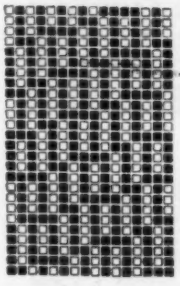
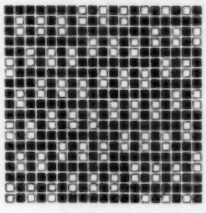


FIG. 475.







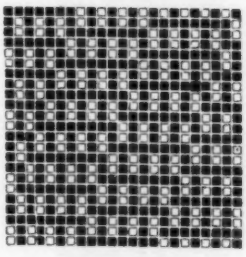


FIG. 476

FIG. 477.

FIG. 478.

FIG. 462.

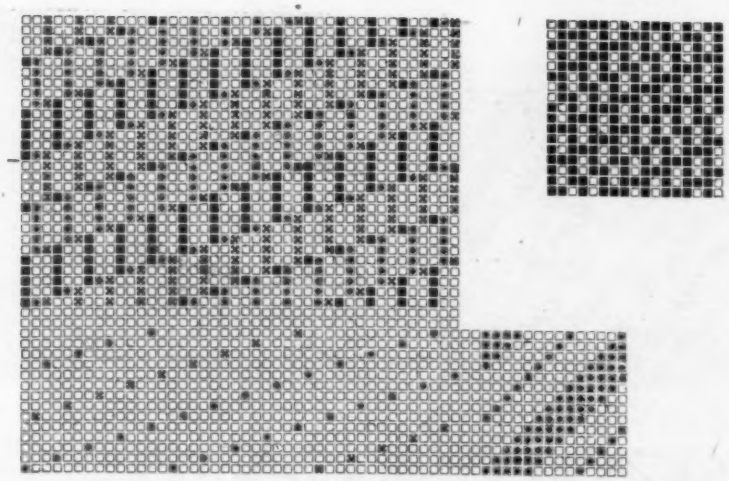


FIG. 461.

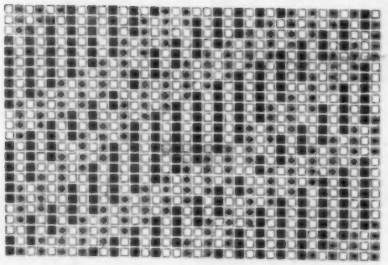


FIG. 463.

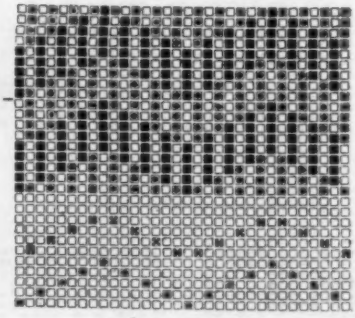
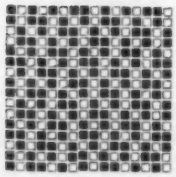


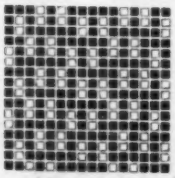
FIG. 464.

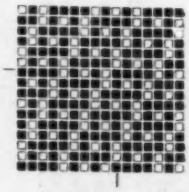
FIG. 466.

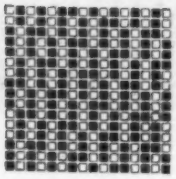
FIG. 467.

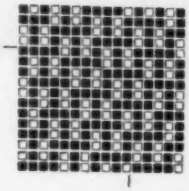
FIG. 468.











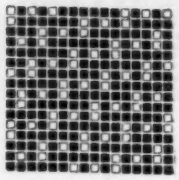


FIG. 469.

FIG. 470.

FIG. 471.

Other variations are shown at Figs. 466 to 478.

Fig. 466, 7-shaft.
Fig. 467, 8-shaft.
Fig. 468, 9-shaft.
Fig. 469, 11-shaft.
Fig. 470, 11-shaft.
Fig. 471, 11-shaft.
Fig. 472, 13-shaft.

FIG. 455.

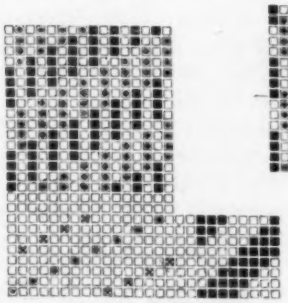


FIG. 456.

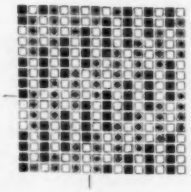
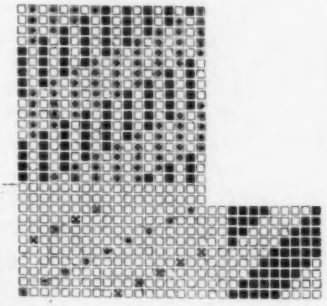


FIG. 457.



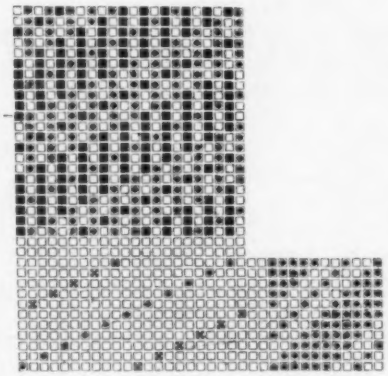


FIG. 458.

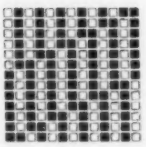


FIG. 459.

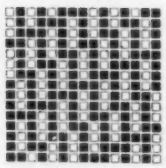


FIG. 460.

Fig. 473, 13-shaft.
Fig. 474, 15-shaft.
Fig. 475, 17-shaft.
Fig. 476, 13-shaft.
Fig. 477, 19-shaft.
Fig. 478, 23-shaft.

Corkscrew twills may be developed with filling as well as with warp floats.

(To be continued.)

The exports of embroideries from Switzerland to the United States during 1911 amounted to $6,021,932 as compared with $6,189,193 in 1910.

ICELAND WOOL

By SIGURGEIR EINARSSON, Reykjavik, Iceland

Many manufacturers have complained of the manner in which Iceland wool is prepared for the market and it must be admitted that these complaints are well founded. Wool growers in Iceland have been urged to wash and grade their wool more carefully, but they have replied that it would not pay them to do so, as the wool would not bring a price that would pay for the increased expense. At the last session of the legislature in Iceland this question was discussed and it was decided to appoint someone to investigate the question and determine the best way to wash and grade Iceland wool. The government of Iceland appointed me to the position. I first visited England, calling on many wool manufacturers there who used Iceland wool. Later I visited the United States and desire to thank the many American wool dealers and manufacturers for their courtesy and the information they gave me in regard

to Iceland wool. On my return home I made a report to the Iceland government. My recommendations may be summarized as follows:

1. That wool be washed at a central station to remove all but 8 or 10 per cent. of the grease, thus doing away with the present

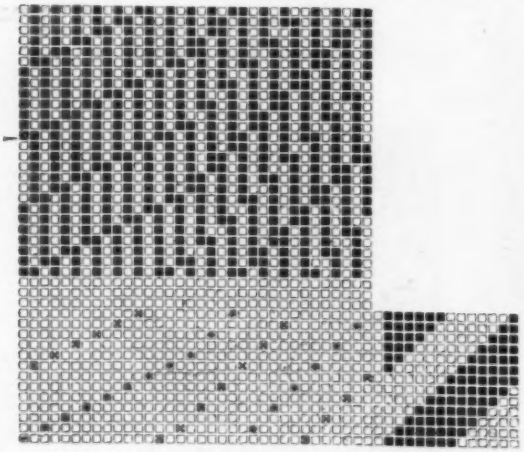


FIG. 465.

situation under which each farmer washes his wool at home by hand.

2. That suitable washing machinery be obtained for the central station.

3. That the wool be well prepared before washing, all grey wool and grease being removed.

4. That all Iceland wool be marked with an export trade mark and a number indicating the district in which it was produced.

5. That all wool be divided into the following grades:

First. All white and well washed wool and wool without stained fibers.

Second. All stained and badly washed wool and britch locks.

Third. Black wool.

Fourth. Mixed wool, grey, black, etc.

I also recommend that pulled wool shall be kept separate, instead of washing it and then mixing it with other wool.

In recent years a large quantity of Iceland wool has been used in the United States, having been shipped from Denmark and England. This involves an extra cost for freight and it would be better for the exporters to sell and ship the wool direct to American manufacturers without depending on middlemen.

Iceland exports annually 2,000,000 pounds of wool, and direct connection between Iceland and the United States would be of advantage to both countries. A large number of the products of the United States are used in Iceland, such as flour, maize, petroleum, machine tools, etc. Our annual imports from Denmark and England are valued at about $840,000. Our imports are rapidly increasing, having amounted to $4,480,000 last year. A number of governments have taken steps to develop trade with us. France and Norway have consuls in Iceland, also England, Germany, Belgium, Sweden and Italy, and we have direct connection with Denmark and England. The United States has no consul here and apparently is not taking special interest in our trade.

ENGLISH NOTES

By Our Regular Correspondent

In print and in private the Tariff Board's report on Schedule K has been discussed at full length in Yorkshire, where the daily papers gave space generously to the subject. The net outcome is a deeper and wider conviction that for the present nothing material is to be done. The report was awaited eagerly on both accounts. Large purchases of wool on American behalf or a redistribution of American buying so that it should range freely over the whole supply, and not be restricted to wools of light shrinkage, might have been scarcely less momentous to our manufacturers than our wool dealers. The prospect had the anxious attention of those Huddersfield mills which have to fix prices in advance and are forbidden by trade custom to advance prices in mid-season. They are apt to look on Americans as the bad boys of the wool market. Dealers and topmakers would of course have welcomed an American onrush strong enough to lift the drooping values of wool.

* * *

English silk spinners have had a good American year, with shipments of yarn valued at over 1 1/4 million dollars from the

Bradford consular area alone, and the sum $200,000 of silk noils, all sold at high prices. The yarn and the noils are preponderantly tussah and the yarn is in plush counts. During the past ten years the waste-spinning industry here has increasingly become a business in tussah, and the production of white yarn has decreased by something nearer to 75 than to 50 per cent. The raw material has advanced beyond bounds, both in price and delivery date and the market is demoralized. The waste has improved somewhat in quality. At 50 to 60 cents No. 1 tussah waste cannot well be an unremunerative article to produce. Relatively to the weight of "raws" (wound silk) the production is always large and more waste than "raws" is calculated upon. The better the price of waste and the more of the inside of the cocoon does the filature manager allow to pass into it. The fatter the waste, the more long fiber finds its way into the noils, and this fact has something to do with making long noils longer and more valuable in the eyes of the American manufacturer of woolen overcoatings.

The decision to tax noils principally composed of fibers over two inches long at the rate of 35 cents per pound effectually closes the door to long noils and may exclude some recombed or "exhaust" noil. Dealers in the article had expected a less unfavorable result from the protracted delay in coming to a decision, and some of them may be expected to take an active part in attempts to have the decision reversed. The producers, who profit most from the high American prices for noils, have declined hitherto to take any steps other than passive ones. It is pointed out that the Treasury Department is entirely wrong in stating that first, second, etc., combings are "usually termed first-draft noils." In English practice the word noil is exclusively applied to the residue remaining when the dressing has been completed. The long-noil is the by-product of the long-spinner and the Treasury Department is unequivocally wrong in stating that the long-spinner's noil is termed "exhausted noil." It has been repeatedly explained in these pages that exhaust noils are the by-product of a different order of spinners, who produce a cheaper and less lustrous yarn known as short-spun. They buy long noils to comb upon their square or circular combs and draw away the longer fiber in sliver. The long noil is the "waste" of the long spinner's process, and the exhaust the "waste" of the short spinner's, and the latter is the raw material of those who spin silk on the woolen principle into cheap noil yarn and silk noil sponge cloth.

* * *

A new attempt to supply Lancashire with a textile museum is promoted by a school man, head of the Manchester School of Technology, who has visions of a museum containing examples of all the fabrics made or used in all the countries of the world. Previous projects of the kind have not been taken too enthusiastically by manufacturers, useful as a museum possibly might be. The exhibits we have are antiques or the efforts of aspiring students. There is always the danger that exhibitions will do as much harm as good. Taste changes and it is a disservice to expose patterns which are out of date or present only imperfectly the prevailing taste. Artistic designs are faced with the difficulty of getting pure examples of past periods—Jacobean or Queen Anne for instance—and they need to have their inspiration pure. It would be at least difficult to keep bastard types out of a collection exhibited as models of what will sell in different parts of the globe. Manchester with its many nationalities and diverse trading interests is already fairly well informed, and the idea that it is possible to give to students and the world in general as accurate a judgment as that possessed by experienced specialists may be seriously delusive.

* * *

The wool conditioning returns show no abatement of anxiety to see what it is that one is getting in buying tops. The Bradford establishment made in round numbers 700 tests per day for moisture, throughout last year, or 222,998 altogether. Some five thousand tests for counts, three thousand odd for scouring losses and nearly seven thousand miscellaneous tests, bring the total substan-

tially to 238,000. Seventy-two million pounds of tops, nine millions of wool, five of noils and six of wastes as well as 2 3/4 millions of worsted yarn were put to the touch. The Roubaix-Tourcoing Conditioning-house dealt with 58,000 tons of tops, apart from 2,500 tons treated for the "a ternic" market and from 16,000 tons of yarn. Another 10,000 tons of tops and 6,000 tons of yarn were conditioned in the Rheims, Fourmies, Amiens and Le Cateau conditioning houses. The Continentals, it may be seen, are more cautious than either English or Americans in the matter of paying for moisture. The tests at Bradford are mainly made to satisfy Continental customers.

* * *

The newest textile by-product in this country is at the same time one of the strangest and most useful of side-issues from a mill. It is cement—Portland cement—production of which on a commercial scale is just beginning at Bradford. Those who mercerize cotton on a sufficiently large scale find it more profitable to recover and regenerate their caustic soda than to buy new. In the process they employ quantities of lime and the spent lime becomes in some cases a veritable nuisance, removable only at 37 cents a load. This is the material from which the cement comes and by all accounts parties lately connected with the Dyers' Association have found the way to make a very strong and cheap cement. Slag and cinders are abundant in the locality, there is a spot market for the goods, and the prospect before the $125,000 company is a distinctly promising one. If pork packers make buttons, and explosives manufacturers make soap, why should not cotton manufacturers make cement?

* * *

The overcoating called in American trade "chinchilla" is what a Batley man would call a fancy nap. Plain naps, usually with a well-hidden cotton warp, are one of the staples of the Yorkshire trade and are made in broad width and heavy weights at prices ranging from about 26 cents upwards. They are single cloth dyed black, blue or brown, or sold in blended mixtures, whereas chinchilla is a double structure. The surface is cut in various styles varying from a pinhead nap to coarser tufts, and when the cutting is done to form waves the goods are sold under the name "elysians." Naps of good quality with a mossy finish are features of the men's trade this winter. Reversible cloths of a tweed more than a nap character and in plain or mixture rather than a pattern effect are worn more by women. Long cloaks with a bright tan, green or heliotrope backing, turned over at the collar and cuffs, are worn largely, and the cloths to make them are produced out of the very cheapest raw materials. The back is in most cases in strong contrast with the face and attached to it by a third or stitching warp of cotton. Whether modifications of the cutting and the coloring of the back might be useful in America, manufacturers may decide.

* * *

So far as the available information goes the colored worsted spinner, as he exists in England, is almost without a parallel in America. Producers of white yarn turn to colored stuff occasionally, but the reference is rather to the specialists who touch no undyed tops and devote themselves to making elaborate and complex concoctions of colors for the service of the highest class of worsted looms. The best of them go to infinite pains to produce the neatly knitted ranges which provide designers with inspiration. They employ color-mixers who are highly paid to do nothing else than discover shades for the dyer to produce and next to gill these together in every likely and unlikely combination and proportion. One such spinner who is at the top of the trade dyes no less than 60,000 lbs. of slubbing a year into lots of 25 lbs. to a color. The material is fine merino with, in times like the present, a proportion of the best crossbred. He will go to unlimited trouble to provide a good manufacturer with precisely the article he wants and make his deliveries as perfect as human agency can make them, but the price is apt to be the one he mentions rather than that which the customer may choose to offer. It

is a proved possibility in this country to keep some 30,000 spindles regularly busy in this way and to make a very satisfactory profit out of them. Naturally, the trade calls for a nice display of taste.

* * *

A discussion upon Exchange hours has brought to mind the rather quaint "Rules and Orders" framed in 1790 for observance by merchants, buyers and occupiers of stands in the Manufacturers' Hall, Bradford. These ordained that the gates should be opened at 8 or 8.30 A. M. every Thursday morning, solely for the reception of woolen goods, and that buyers should not be admitted before ten, when the bell rang. At 11.30 the bell was again struck and those who sold before or after the ringing-on or ringing-off were fined five shillings, half of which sum went to the informer. In the morning cloth was sold and from 2 to 3.30 in the afternoon the hall was sacred to the sale of yarn. Nobody was allowed to take a partner upon his stand or exhibit property not his own for sale, and anybody encroaching on a neighbor's space or behaving in a rude or disorderly manner could lawfully be expelled.

Rule X prescribed that "all Goods be delivered a Quarter of a Yard longer than they are commonly called. To wit, those called Thirty Yards to be 30 1/4," and provided for a fine of sixpence in the case of ordinary goods or twice as much if broad calamancos or russels were found short. There was a standard yard measure in the Hall and the keeper got a penny per piece for every piece measured upon it. The last words of the notice are particularly sound ones: "N. B. That the Disputes about the length of Pieces be settled the Day the Goods are bought."

* * *

Nearly every large spinner, comber, dyer, bleacher or printer and not a few manufacturers have replaced horses by motor wagons. The cost is great, but the motors cover the distance in the available time and enable the mill to get along faster with the work. The cost is heaviest where the hills are steepest and they are nowhere worse than in the West Riding from whence comes this record of the cost per mile of running a 2 1/2 to 3 ton gasoline wagon, as ascertained by a dyeing firm.

	Per Mile
Tires cost $550 per 10,000 miles	$0.05½
Gasoline	.02½
Lubricating	.00¼
Wages man and boy	.05¼
Repairs	.00½
Interest 5%, Depreciation 15%, Insurance	.04
Sundries	.00½
	$0.18½

This is the equivalent of $26.25 per 250 mile-week. Probably some users have not got off so cheaply.

THE SCOTCH TWEED TRADE

By Dr. T. OLIVER, Director, South of Scotland Central Technical College, Galashiels.

The center of the celebrated Scotch Tweed Trade is at Galashiels, a town of 15,000 inhabitants with 850 looms and 100 sets of cards in operation. Selkirk, a very old town six miles distant with 6,000 inhabitants, has of late years become important as a woolen producer with 450 looms and 50 sets of cards. Six large firms control nine mills in the Tweed Valley, in Peebles, Innerleithen, and Walkerburn, with over 550 looms and 50 sets. Earlston with one large and growing firm, Jedburgh with three small concerns and also a few isolated mills in villages complete the near district. Hawick with 17,000 inhabitants, 20 miles south, was formerly much more interested in weaving and spinning than nowadays. But in the last decade seven out of 14 mills have stopped some 300 looms and 60 sets of cards have been scrapped without replacement. There are now about 600 looms and 40 sets of cards in use in Hawick. Twenty years ago Hawick had 1,200 looms and 100 sets. The looms were, however, mostly of the old slow Platt type. The great business of Hawick has come to be hosiery knitting, which has far outstripped its older rival, weaving. This trade has increased tremendously in the last ten years. Hawick hosiery is reputed as of the highest quality procurable. The sta-

tistics in this article do not take note of the capital and output of the hosiery trade. Two large mills in Dumfries and several small ones in Langholm complete the Scotch tweed district proper.

Tweed manufacturing is, however, practiced to a lesser degree all over Scotland. Five mills in Alva and Tillicoultry with about 450 looms are engaged on tweeds, woolen shirtings, etc. These towns have also a decaying shawl industry. Paton's yarn mills at Alloa employ 1,800 hands. They contain about 100 sets of woolen cards, 25 worsted combs and 12,000 worsted spindles. Crombie's large mills at Aberdeen have 304 looms and 30 sets of cards and 1,500 hands employed on the finest qualities of piece dyed coatings, etc. There are two tweed mills at Elgin, one at Keith, two at Inverness and so on. In the Glasgow district covering also Paisley and Ayrshire about 7,000 people are employed in a nondescript trade of worsted and woolen manufacture of carpets, blankets and a large variety of fabrics, but not much of which would come under the description of "tweed." There are over one million sheep in the Scottish border counties. About 50 per cent. are of the pure Cheviot breed, 12 per cent. black faced and the remainder half bred, chiefly Leicester-Cheviot cross, with a smaller proportion of Down-Cheviot and Cheviot-blackfaced crosses. These yield upward of 5,000,000 pounds of unwashed wool. The Cheviot and half-bred wool is, however, marketed in the fleece washed condition, while the black faced type is usually sold unwashed. This district possesses probably more sheep per acre than are found anywhere else in the world. Undoubtedly that is the reason that the Scotch tweed trade found a home in the valley of the Tweed and its tributaries.

The origin of the word tweed in its industrial sense is interesting. In the early part of the nineteenth century a considerable trade in Scotch tweels had sprung up with the London merchants. In 1826 the firm of Merrs. Wm. Watson & Son, Hawick, consigned a quantity of these goods to Messrs. Jas. Locke & Co., then the leading woolen warehousemen in the West End of London. In making out the invoice the clerk, who was probably a better weaver than a penman, by a slip transformed "tweels" into "tweeds." The merchant, thinking this was an appropriate designation, repeated more "tweeds." The name and cloth caught the public favor and the name has been reserved.

Great as the home supply of wool is in these counties, it is insufficient to meet 20 per cent. of the requirements of the tweed industry. The woolen mills manufacture about 30 million pounds of raw wool, chiefly from Australia, New Zealand, South Africa, and the Argentine. Much of the wool is, however, scoured before it reaches the manufacturer so that the weight put in work is considerably less. The wool, valued at over $8,000,000, yielding about 10,000 miles of broadcloth 58 inches wide, representing a value of $16,000,000 to the manufacturer and after passing through the hands of the woolen merchants and tailors will be debited against the wearer to an amount of $36,000,000 and will form the material for garments of the highest class worth approximately $60,000,000. There are about 300 sets of carding machines, about 230,000 mule spindles and 3,000 power looms engaged in this work employing about 11,500 people earning about $3,000,000 in wages per annum. The capital sunk in the Tweed industry will exceed $18,000,000.

It is probable that in 1910 and in 1911 30 per cent. more cloth was turned out than was turned out in 1889, when the tweed trade was reputed to be at its zenith. At the earlier date there were about 4,500 looms in operation. These were, however, for the most part slow speed 45 to 50 picks per minute. The new 108-pick per minute looms fitted with the whip pick have very high efficiency. On good crossbred worsted some of them average over 90 per cent. effective running. Although Scotch manufacturers are remarkably well equipped in their weaving departments, they are rather backward in yarn making. Many of the plants are old and inefficient.

DOUBLE VENTILATION FOR COTTON SPINNING

By CHAS. M. STOY, Anniston, Ala.

I believe spinning rooms could be very much benefited and the work made to run much better by the use of double ventilation, especially in the South and warm climates. It could also be used in the North during the warmer months with great success. If the double ventilation system were used, cotton spinning would be much improved, and the important problem of controlling the temperature of the spinning room would be solved. In addition to the air entering the spinning room at top of the window sash, it should also enter near the floor line. In most of the modern mills the spinning room is located either on the top story or ground floor. If on the ground floor, the mill generally is a single story building, consequently the roof is immediately above, the same as if the room were at the top of a four-story structure. In summer the heat pours down on both, and the high-speed spindles generate heat, causing the spinning room to be the hottest room in the mill, the thermometer often rising to 95° to 110° F., even with a good system of humidifiers and gravel roofs. These conditions cause the yarn to be brittle and tender, and result in waste, overworked spinners and bad work. This increases seconds, cuts down production and lowers quality, decreasing profits for the manufacturer.

With the present system the fresh air comes in high up over the operative's head as the lower sash and very often the second sash are fixtures only used to let in light. The third sash is made to tip or drop inward from the top, which allows fresh air to enter the room near the ceiling. This takes the hot air that is next the roof out through the ventilators, provided there are a sufficient number of them on the roof. This, however, does not overcome the difficulty, and many mills have installed fans which have gone a step further towards relieving the situation. The window sash remains stationary and the air that comes into the room enters too high to carry the heated and impure air out. As a result a large percentage of stagnant air hangs over both operative and machine, producing a bad effect on both man and work. The humidifier system goes a long way towards helping the situation, yet the evil is still in evidence, and we are still looking for an improvement. I believe the double system of ventilation will go a long way towards giving a more perfect and satisfactory temperature in the spinning room. I would have the windows as high as at present, but drop to within six inches of the floor. Instead of three sash, that is, the two sash and the tipping or transom sash, I would have a fourth, reaching from within six inches of the floor up to the bottom of the present sash. This bottom sash would be weighted so it can be raised or lowered at will. On the inside of the bottom sash have a wire grating, stout enough so that it will withstand knocks and punches from the help, and fine enough so they cannot push bobbins through it. On the outside of the sash, made into the wall, have a blind made of wood or tile, which will shed water, yet admit fresh air. The sash at the top can be let down, or tipped, and this new sash can be raised at the bottom.

This arrangement would give a better circulation of fresh air, which would follow the line of the floor, for there is always a draft next to it. The heated air, which is on the floor, would be lifted and forced out of the room. The blind grating will check too strong a current of air, and keep out the rain and wind. In unfavorable weather conditions the bottom sash can be lowered. At such times the room is generally cool and pleasant without its use. I do not think that the work of the humidifier system would be hindered by the introduction of the lower current of air, but that by its introduction the whole atmosphere in the room will be more even, and at the same time, the help and the work would receive the benefit of the fresh, invigorating air from without. What few slack bands on the spinning frames this lower current of fresh air would cause, would be offset by the resulting advantage, such as better running work, a larger number of sides to the spinner, a smaller number of and better paid help working under more

satisfactory conditions. There would also be a saving in the cost of the construction of the building, as there would be less brick and mortar used and more air and light obtained.

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THE TRANSMITTING CAPACITIES OF DIFFERENT PULLEYS

Cornell University, Ithaca, N. Y.,
Dec. 28, 1911.

Editor Textile World Record:

In the December issue of the Textile World Record an article appeared on page 343, under the title of "The Transmitting Capacities of Different Pulleys," in which it was pointed out that Lawrence Whitcomb, treasurer of the Cork Insert Co., had "severely criticised" a paper read by the writer before the National Association of Cotton Manufacturers at the Manchester meeting. It was not pointed out, however, that there was any reply to Mr. Whitcomb's criticism nor that there was any further discussion of the paper, and the reader is naturally led to infer that there was not. That this is contrary to fact is known by all who were present at the meeting and may be ascertained by any who have access to the transactions of the association when they were completed.

The writer does not believe that an article of this character is likely to mislead anyone who is interested in the subject of belt transmission in a large way. Such a person will take the trouble to look up both sides of the question and weigh them on their merits. It is the small user and the man who has not the time nor opportunity to get a view of the subject from all sides that is likely to be the most influenced, and the writer would call his attention to the following facts:

1. That in the discussion before the N. A. C. M., which followed the paper above referred to, it was brought out that the Cork Insert Co., of which Mr. Whitcomb is treasurer, had caused certain tests to be made which included tests of a fiber pulley, and that the results obtained from the fiber pulley were practically equal to those from the cork insert pulleys, but, that in the published report sent out by the Cork Insert Co. the results from the fiber pulley were not included nor was any reference made to the fact that such a pulley had been tested.

2. That although Mr. Whitcomb speaks of "the many others which have been made," he cites the reader to but one set of tests, namely, those made at the Lowell Textile School.

3. That the losses between belt and pulleys in a practical transmission rarely exceed about 2 per cent. and are often less.

4. That 200 to 225 pounds per square inch tension in the tight side of an oak tanned leather belt was found, by F. W. Taylor, in a series of tests covering a period of nine years and reported in the Transactions of the American Society of Mechanical Engineers, Vol. 15, 1894, to be the most economical belt tension to use.

A perusal of the report to which Mr. Whitcomb refers brings out the following very significant features: that the tests were made, apparently, without the special equipment necessary for making accurate belt or pulley tests; that the arc of contact is given for but one condition of load and that not stated; that the sum of the tensions ($T_1 + T_2$) was kept constant and at but 75 pounds per square inch cross section of the belt, while no data is given by which the difference in tensions nor the stresses in the tight side of the belt can be computed; and, lastly, that the curves exhibited to show the characteristics of the different pulleys show losses varying from a minimum of 21 per cent. to a maximum of 100 per cent., thus leaving the reader to sift out the small loss of transmission from the enormous losses from other sources.

When we consider that the most economical belt stress for the tight side alone is from 200 to 225 pounds per square inch of cross section and that the only tension used in these tests was such as to give the ridiculously low value of 75 pounds per square inch for the sum of the stresses in both sides of the belt, we are led to wonder if there is any limit to the investment which Mr. Whitcomb would ask the user to make in belts in order to accommodate the use of cork insert pulleys.

W. M. Sawdon,
Asst. Prof. Experimental Engineering.

THE VIBRATION OF BUILDINGS

In concrete steel monolithic construction for mills and other structures, when properly designed, the entire mass acts as a unit to absorb vibrations set up in its various parts, the only tendency being to set up an oscillation of the entire structure, but this can be generally avoided if proper foundations are constructed. The eight-story reinforced concrete Ketterlinus Building in Philadelphia is an excellent type of the most improved construction for large printing plants. Though the fifteen and twenty-ton presses are located on the third, fourth and fifth floors, very little vibration is noticeable.

It is well known that rapid vibrations caused by machinery running at high speeds cause vertical vibrations, while the slow running machines produce slower vibrations or oscillations. The former may be confined to certain definite parts of the structure, while the other generally includes the structure as a whole. There may be both vibration and oscillation in the same structure.

From a comparison of vibrations existing in textile mills in England and this country, it has been observed that by reason of the character of the construction of the mill and the location and operation of the looms, the English mills are much less affected by vibration and it has been said that the character of the fabric obtained from such mills are much superior.

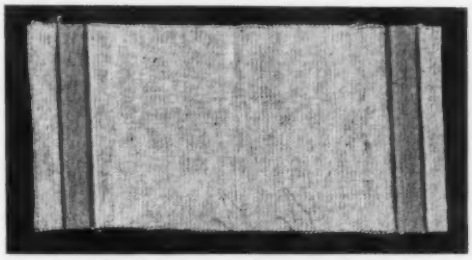
It is important that foundations should be so constructed that the vibrations set up in the building itself will have no tendency to be transmitted to adjoining buildings; that they be so constructed that the vibrations set up in the building itself will not have the effect of seriously settling it; that the sub and super-structure be of sufficiently rigid construction to absorb these vibrations as much as possible.

It is believed that if consideration be given to these facts before the construction of any building such methods and types would be adopted as to obviate to a great extent the possibility of vibratory effect. Not only would a considerable nuisance and perhaps danger be obviated both to the building itself and adjoining property but the life of the structure would be materially increased and costly litigations be avoided.

RUSSIAN CORD

BY KAPPA

The sample of Russian cord shirting shown in the cut has nearly the same construction found in many high class shirtings of today. The ground set is 68 ends of 1/78s combed peeler and 98 picks of 1/54s combed



A SAMPLE OF RUSSIAN CORD.

peeler per inch. The set over all is 78 by 98. This grade of shirting runs about 7.14 yards per pound and is finished 32 inches wide. The drawing in draft is as follows:

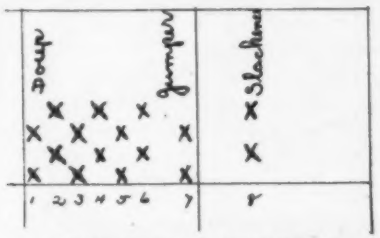
168 ends white, beam No. 1 drawn straight on 3-4-5-6 harness.
1 end blue (5 ply), beam No. 2 drawn on 7th harness.
1 end blue (doup), beam No. 3 drawn on 8th harness.
12 ends blue, beam No. 2 drawn straight on 3-4-5-6 harness.
1 end blue (5 ply), beam No. 2 drawn on 8th harness.
112 ends white, beam No. 1 drawn straight on 3-4-5-6 harness.

This pattern is repeated 7 times and 28 dents into the next pattern. The selvage is drawn 24 ends 2 ply and is reeded 2 ends 2 ply per dent on each side. The take-up on the ground warp and on beam No. 2 is about 8 per cent. and on the lens end about 100 per cent. In other words it requires about two yards of yarn on beam 3 to weave one yard of cloth.

At first sight Russian cords are almost invariably taken for Bedford cords, for they have that general appearance, each being a

fabric having a raised cord or a series of raised cords. Bedford cords are usually made with white yarn and the Russian cord with colored yarn, which makes a more pronounced effect, but the real difference in the cords is in the weave.

The Bedford cord is formed by the filling floating under and weaving in a number of coarse threads, forming a rib, while the Russian cord is formed by one end of warp weaving leno across a bunch of threads, also forming a rib. The threads forming the bunch for the Russian cord do not show



WEAVE DRAFT FOR RUSSIAN CORD.

either on the face or on the back, the entire covering on the face being formed by the leno end.

A large proportion of Russian cord fabrics are made on dobby looms having no figure in the cloth, although some mills are making them on jacquard looms. The advantage of making this cloth on a jacquard loom is, that one is not restricted to a plain or simple pattern in the ground, but can have any variety of attractive small patterns between the stripes, or have an all over pattern broken by the Russian cords running through. Following is the lay out or working plan of the sample shown in the cut:

Beam 1 is the ground warp (white).

Beam 2 is the cord (blue).

Beam 3 is the douping end (blue).

The selvage is drawn, 24 ends 2 ply on each side.

As will be seen in the accompanying plan, the end drawn on the eighth harness is also drawn on the loop on the first harness.

The five ends drawn through the seventh harness are in one heddle and cross over the one drawn on the eighth harness. This forms the foundation for the end to doup over. This is known as a bottom doup lay out and several important points must be observed. The first is an attachment placed on the machine to raise the first harness every time the second harness is raised. If this is not done, either the doup or the ends in it will break. The second is an arrangement placed on harness 7 to lift it at least half way up after harnesses 1, 2 and 8 have formed a doup. This arrangement is called a jumper and lifts the ends out of the way when the doups are returning to their natural position. The last arrangement is one whereby the end which doups (1 and 8) can be slackened when it crosses the ends on the seventh harness. It should be slackened at least half an inch to allow for this cross over, after which it must be tightened again. The most satisfactory way of making this kind of a leno is with a split reed. This is an auxiliary reed, which contains the douping end and the ones that are to be douped over and is made by using three dents, the middle one being soldered about half way up, forming a bar across it, the wires above the bar being cut off. The douping end is drawn through the dent that has the bar across the top and the ends to be douped over are drawn in the large space, made by cutting the wires above the bar, these to be crossed before being drawn through the reed.

It will be readily seen that with three attachments (one to move the reed to one side, one to raise it, one to lower it and a spring to bring it back to its original position) this arrangement can be made to do what the doup does in a regular leno and has the advantage of not breaking the doup yarn. This is a very simple and positive action and in some places is largely used in preference to the old fashioned method.

Russian cords have prospects of being a very popular fabric, because of their snappy, clean cut appearance so much desired in shirtings and waistings. They offer in this respect advantages that cannot be obtained in the ordinary colored striped fabric.

The value of the American cotton crop, including the seed, amounts annually to approximately $800,000,000.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

DYEING MERCERIZED COTTON

Editor Textile World Record:

We have been trying to get a pink and blue mercerized cotton that will stand dyeing and come out bright and of the same color. We bought developed colors and have been very careful about dyeing, but the colors change so much that they are no good. We color an acid black in a formic acid bath and we desire a pink and blue that will stand cross dyeing for forty minutes in this bath. The colors that we have tried so far have all come off during the dyeing process. Will you please tell us how to overcome this?

Dyer (1986).

From this inquiry it appears that "Dyer" desires to obtain a pink and blue color on mercerized cotton which is fast to cross-dyeing, the cross-dye being an acid black employed in a bath containing formic acid. In this case, for the blue it would be possible to use a number of sulphur blues of the various brands at present on the market; the exact selection, of course, would depend on the particular shade of blue desired. It would also be possible to obtain a cross-dye blue by using some of the basic blue dyes applied on a mordant of tannin and antimony; the exact dyestuff to be employed also in this case would depend on the shade desired. The problem of getting a pink color on mercerized cotton fast to cross-dyeing, is more difficult, especially if it is desired to have a pink of a very clear and bright tone. The sulphur colors in such a case would not be applicable, as they would not yield a pink of sufficiently bright a hue, and the basic colors which are at command for this purpose are not especially fast to cross-dyeing. However, it would be possible to employ some of the more recent vat colors for this purpose. The indanthrene, thio-indigo colors, and helindone colors would be suitable for this purpose. It might also be said that these vat colors could be used for the production of cross-dyed blue desired. It must be borne in mind, however, that the acid black which is used for the cross-dyeing of the wool will more or less affect and stain the colors on the mercerized cotton. This effect would probably be very little noticed in the case of the blue color, especially if this color were of a dark blue, but, of course, the slightest stain of the black would make itself very apparent in the pink color. There are various acid blacks, of course, and some of them would naturally have a greater effect in this way than others and it would be a matter of some investigation by the dyer to fix upon a particular acid black which would give him the proper shade on his wool and also the minimum staining effect on the pink dyed cotton.

J. M. Matthews.

GRINDING WOOL CARDS

Editor Textile World Record:

How often should a card be ground in order to keep it in the best possible condition on 50 per cent. good clean fine Territory wool, 50 per cent. fine shoddy?

What are the causes of rough, twitty or bunchy work from cards and how avoided?

How does a perfectly ground point on a wool card look?

What is the best size of wire and clothing to use on a set of woolen cards on all fine stock (strictly fine), in order to make good, smooth, even work free from specks or mixtures of all kinds?

How close can carding surfaces on a wool card be kept and not touch, and what thickness of gauge is best to use to do the setting?

What is best for carding out specks, a rough point or an absolutely polished, smooth point, no matter what the shape of that point may be?

Carder (1981).

Cards should be ground as often as they get dull. It is a good plan for the carder to look over his cards every day or two, to see if there are any dull places on either workers or cylinders. If there are, they should

be ground as soon as possible. It is a good plan to use what is called a false worker, which is an iron shaft to take the place of any worker that may be removed. The cylinder should also be watched for blisters. A card will never do good work when dull. It may have to be ground in three or four days, or it may run as many months.

Twits are made in a number of ways. A single wire may be pulled up in a ring so as to stand a little higher than the others. This will often cause a twit every time it comes to the wipe roll.

Rings should be watched carefully for high wires, which should be put in place with a tube. Noils will sometimes make twits. There are usually short splinters in noils. One of these may get stuck between the wires of a ring, and make a twit every time it comes to the wipe roll. Twits are often made on the mule and the carder is frequently blamed for them. Many mules are run without a feed rope, the spinner turning the quadrant by hand.

If the spinner happens to be at the end of the machine piecing up, and thinks the mule will go in without breaking down, he frequently stays there instead of attending to the quadrant. In this way twits may be made the whole length of the mule. A single stretch in the mule may in this way make more twits than a carder will make in half a day. Dull wire will make rough work at any time, and bunchy work is usually made by the stock going in uneven on the feed end of the card. The top feed roll should always be covered with shorter wire than the bottom. The lickerin should be covered with short wire. In this way a great deal of bunchy work can be prevented.

It is a good plan to have the worker pulleys of different sizes. This will prevent many bunches. The appearance of a ground point on a wool card depends on what it is ground with. If it is ground with fine emery or an old worn out grinder, it will look like a chisel. If the emery is of a good quality and No. 8 in size, it will grind the wire more to a needle point, which is much to be preferred.

I prefer No. 32 for first breaker; No. 33 for second breaker; No. 34 for finisher; with a straight wire open set for the fancy. I never use filleting on a cylinder. I much prefer sheets. Filleting will fill up much more quickly than sheets, and the stock is harder to raise from it. Filleting will not make such even roving, for when the card is filled up the top doffer will take more than its share of stock.

If the rolls are true carding surface on a wool card can be set to a 32 gauge and not touch when at work. A fine, sharp point is best for all work on a card. Lytton.

SHRINKING LINEN CLOTH

Editor Textile World Record:

Are there any methods of shrinking cloth in addition to that of drying by air? In the air drying process can the cloth be looped vertically, and if so, how long can the loops be consistent with proper shrinkage? What should be the temperature, speed and volume of air? Can it be passed through the cloth instead of over it?

Corinth (1977).

All textiles are woven on the loom under tension. The shrinking is obtained by the wetting out of the fabric, which causes it to shrink in the width. A dampening by the use of steam or water and pulling the fabric lengthwise will cause some shrink. Practice alone would determine the required humidity to produce the desired result. When the fabric or cloth, as in the case of linens for the clothing trade, which must be absolutely shrunk to prevent further shrinkage when made up in a garment, it must be thoroughly saturated. Then the cloth must be dried. Now the best drying for fabrics is the air drying process. The cloth is suspended or festooned from the ceiling on wooden rails. The windows in the room are opened to allow a free passage of the outside air. The time required for this drying depends on the season of the year. The main feature of air drying is that it leaves the fabric with a mellow clothy feel.

Unfortunately this drying is only available for about half the year. Damp and cold days must be excluded. Steam or hot air drying is substituted. In the former case coils of steam pipes are placed on the floor, the windows closed, and the drying begins. If hot air is used, and it is a very good system, the cloth still festooned or hung from

the ceiling receives a steady blow of hot air which is obtained by the use of a stack of steam pipes and a blower which sucks in the cold air, forces it over the heated pipes and is afterwards distributed in the room wherever it will do the most good. In both cases an exhaust fan should be used to remove the humidity; if this is not done the drying will be retarded just so much.

Instead of festooning the cloth from the ceiling it could be made to travel mechanically lengthwise and hot air could be blown through either upwards or downwards through the cloth. This, of course, would be a great labor saver.

Speed, time and volume of air needed can only be determined when the daily production and the weight of the fabric is stated. For instance, a piece of saturated linen will absorb about 1 1/2 times its weight and this wetness must be brought to a boiling point before the evaporation begins.

Ventilation. This, of course, is very important in all cases and the location of the fans could best be determined by a ventilation engineer after an examination of the premises.

The treatment of shrunk linens is generally very crude, expensive and slow. A sketch of a new method will shortly appear in the Textile World Record.

John D. Street.

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PRICE OF CUSTOM WEAVING

Editor Textile World Record:

What is the usual method of adjusting the rate for custom weaving? I have 40 looms which a manufacturer desires to have me operate on his goods. Kentucky (1983).

We have referred this question to a practical manufacturer who has had experience in custom weaving and he replies as follows:

The question is a hard one to answer without knowing the class of goods "Kentucky" has a chance to weave. We pay all the way from a mill and three-quarters to two and three-quarter mills per pick on our piece dyes, depending on the character and style. If the work was colored work and fancy we would give about three mills. This work is generally a matter of bargain between the two interested parties and I do not know of any fixed rate.

Merrimack.

SIZE OF BLANKETS

Editor Textile World Record:

I have understood the mark "11/4" on a blanket to refer to the size of the blanket, but have found this same mark, "11/4," on blankets of different sizes, and am therefore in doubt as to its meaning. Can you advise me? Broncho (1984).

The mark "11/4" means 2 3/4 yards. Manufacturers of blankets do not, however, adhere strictly to the designated sizes, and the result is the variation which has puzzled "Broncho."

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A DISCONCERTED READER

Editor Textile World Record:

The Textile World Record is a great institution, full of valuable information, set forth in a most attractive manner, and not the least interesting and instructive feature is the personal experience of some man in a mill.

These "personally conducted" experiences add to your paper the necessary touch of sweetness and light, but why do you leave your readers up in the air, with their nerves all on edge as to what happens next to one man, and jump into the beginning of another man's troubles?

An able but very young man, after a hard struggle to get the job, takes hold of the card room in a mill, works nights and Sundays, increases the production of his department so much that no one, from the agent down, has any time for reading the newspapers during hours, and incidentally tightens up the belts on his machines. Everyone is happy, but alas, in the December issue one of those tightened belts lets go, and the "sickening smash" is heard all over the mill. Everyone, from agent to office boy, arrives promptly to view the remains, and to assist at the recent burial of that able young man. Your readers almost hear that "sickening smash," they are right on their toes with excitement, but they hang on bravely for the January installment, eager to know how the funeral was conducted. Imagine the frantic jump for the magazine, the feverish rustle of leaves as we hunt for the story, and then imagine if you can the keen disappointment, the improper comment, thought or spoken, when we are met with "A Knitter's Program," and read how beautifully he made out tickets, ordered and checked cases, and did nothing wrong!

We want to know more about that bad and bold young man who insisted on tightening the belting and keeping everyone on the jump. Was he fired from his job, as a reward for the spectacular "smash," or did he get busy at once and have things running so soon that his agent and superintendent sang hymns of praise, and again made his pay envelope look plump? Tell us quickly, I beg of you, and let that "knitter" take a seat for a while on one of his neatly checked cases.

Anxious (1982).

[The break in the history of the bold and bad young man was due to a mistake in making up the January issue. It is resumed in this issue. While we regret the interruption,

it has brought its compensation in the form of the letter from "Anxious."—Ed.]

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NUMBERING SILK YARN

Editor Textile World Record:

How is silk numbered? Denier (1978).

Spun silk is numbered by the cotton system, the number or count indicating the number of 840-yard hanks per pound. Thus No. 20 spun silk measures 16,800 yards per pound. This applies to both single and ply yarn, the number indicating the resulting count of the twisted or ply thread. Thus a 3-ply No. 10 spun silk is composed of three single strands of No. 30, the count being expressed thus: 10/3; the first number being the count, the second the ply.

Following are several illustrations of spun silk counts:

20/1 = single 20s spun yarn.
12/2 = 2 threads of 24s spun silk.
20/3 = 3 threads of 60s spun silk.

The count of cotton yarn on the other hand always refers to the single strand, and when giving the count, the ply is written first; the count of the single strand second. Thus:

1/20s = single cotton.
2/24s = 2 threads of 24s cotton.
3/60s = 3 threads of 60s cotton.

Raw silk is numbered in all parts of the world by the denier system, which originated in France, and indicates the weight (in deniers) of 400 aunes of silk yarn. The aune is equal to 1.3014 yards; 533 1/3 deniers are equal to 1 ounce. The equivalents of the denier-aune standard (deniers per 400 aunes), as used for raw silk, are as follows:

Pounds per 4,422,112 yards.
Ounces per 277,632 yards.
Drams per 17,352 yards.
Grains per 635 yards.

In English speaking countries, and to some extent on the Continent of Europe, reeled silk is numbered by the drams (1/16 ounce) per 1,000 yards. The denier, dram, runs, cotton and worsted counts are reduced by the following formulas:

2,776 ÷ deniers = Runs.
5,289 ÷ deniers = Cotton No.
7,932 ÷ deniers = Worsted No.
160 ÷ drams = Runs.
305 ÷ drams = Cotton No.
457 ÷ drams = Worsted No.
2,776 ÷ Runs = Denier.
5,289 ÷ Cotton No. = denier.
7,932 ÷ Worsted No. = denier.
160 ÷ Runs = drams.
305 ÷ Cotton No. = drams.
457 ÷ Worsted No. = drams.
Deniers × .0576 = drams.
Drams × 17.352 = deniers.

Ex. Reduce 55 denier to the dram and spun cotton equivalents:

5,289 ÷ 55 (denier) = No. 96 cotton.
.0576 × 55 (denier) = 3.17 dram.

Ex. Reduce 3 dram silk to the denier and spun cotton equivalents:

305 ÷ 3 (dram) = 101.6 cotton.
17.352 × 3 (dram) = 52 denier.

Ex. Reduce No. 50 cotton to the denier and dram equivalents:

305 ÷ 50 (cotton No.) = 6.10 dram.
5,289 ÷ 50 (cotton No.) = 105.8 denier.

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SIZES OF KNITTING MACHINES

Editor Textile World Record:

Please advise us as to the sizes of knitting machines for knitting 4, 5, 6, 7, 8, 9 vest and umbrella pants, using a one and one rib and cut to shape. Is there any special way of handling this line of goods from the knitting to the bleachery and then to the cutters? Also advise us as to the amount of strength this garment will have in stretching on the last turner.

Knitter (1985).

Regarding the sizes, the correspondent should first decide on the weight of the garment, size of yarn and gauge of machine, as the weight of the garment can be varied by the gauge and size of yarn. I give here the sizes of machines for No. 25 yarn knit on a machine with cylinder and dial cut 12 needle to the inch: Size 4, 15 inch; Size 5, 16 inch; Size 6, 17 inch; Size 7, 18 inch; Size 8, 19 inch; Size 9, 20 inch. These are the sizes to get a full sized garment, although I believe that the majority of makers would use one size smaller where they sell to jobbers and have to meet a certain price.

The best way to handle this cloth from knitter to bleacher and from bleacher to cutter is in the fold so as to avoid all stretching and pulling. I believe, however, that the

majority of this work is sent to the bleacher in rolls and after bleaching rolled in rolls again over a calender dryer, then the roll is put on a folding machine, folded in folds and left to condition before cutting.

Madison.

ELASTIC BANDAGES

Editor Textile World Record:

I am enclosing a small sample of elastic bandage. This material is sold in 5-yard lengths and could not be woven on an ordinary loom. I have been partially successful in making this bandage but would welcome any additional information. Can you tell me what process the goods are put through after weaving? I have simply washed and dried. I have thought perhaps it was put through some process after weaving as the hard twist does not alone give the desired effect.

Elastic (1968).

Upon examining and testing the sample submitted I find that it has evidently passed through a weak solution of starch. It is rather difficult to ascertain the exact quantity of starch as the sample is so small. However, I think the following mixture would be

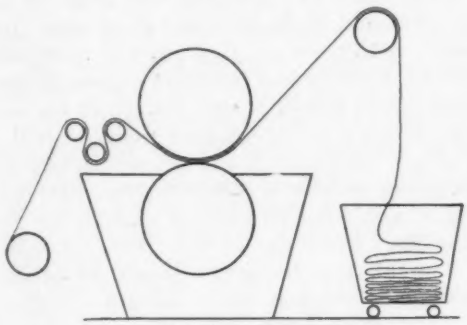

FIG. 1.

about right to get the finish and feel desired. Mix 10 lbs. corn starch, 10 lbs. American or British gum, 10 lbs. wheat starch, making a mixture of about 50 gallons. Put this mixture in a two-bowl mangle, passing the goods through the nip without immersing in the starch solution. Use quite a little pressure on the rolls to squeeze the goods so that they will not come off too wet, then dry. I would first advise putting a small sample or a few yards through the mixture to see how it comes out. If it works out too firm, add a few gallons of water, heated to the same temperature, taking note of how many gallons are added so that when making another batch, you will know the exact quantity of water to be added at first.

If the goods are not firm enough add a little more starch, or if not thick enough in the feel and too stiff add a little more gum or wheat starch, at the same time using a small quantity of some suitable softener to keep

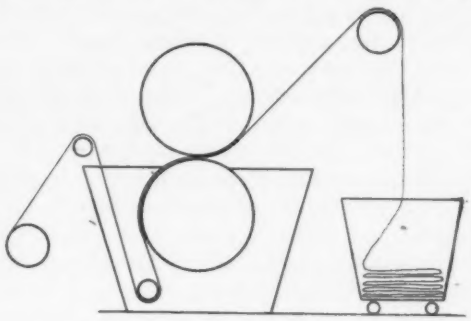

FIG 2.

the goods mellow to the feel. A little glycerine or good soluble oil or oiline oil or some of the other preparations which are on the market. Fig. 1 shows how the goods are passed through the nip without immersing in the starch. Fig. 2 shows the goods passing under the roller and being immersed in the starch solution before passing through the nip.

Delco.

LUSTER ON LININGS

Editor Textile World Record:

Please inform us how to obtain the high luster finish on the cotton and wool serge shown on the green sample enclosed herewith. Also advise what machinery is necessary. We also enclose a sample of brown which has been hydrolic pressed, but lacks hand and luster and will not be accepted by the trade.

Wentworth (1976).

We have analyzed the enclosed samples with the following results:

Green: Warp, 96 threads, 36s cotton. Filling, 62 threads, 26s worsted. 3.8 ounces per yard, 32 inches wide.

These sizes refer to the yarn as found in the cloth. Both samples are woven with a four-leaf twill to the right, 4 down and 1 up.

Brown: Warp, 95 threads, 37s cotton. Filling, 62 threads, 26s worsted. 3.8 ounces per yard, 32 inches wide.

It will thus be seen that the two fabrics are practically identical as far as weight and

set are concerned. The wool from which the filling of the green sample is made seems to me to be somewhat finer and of better blood than the wool in the filling of the brown sample. The green filling is also of a somewhat softer twist. As a result of this difference in the quality of wool and twist of the filling yarn, the brown sample feels thinner and harder than the green, while the face of the green is covered much better than the brown. The warp threads are scarcely distinguishable in the green sample, being almost covered by the soft filling, while the brown cloth is teethy, each warp thread standing out distinct at each twill. In view of the points of difference which I have pointed out, it would seem to me useless to try to get the same finish on the brown sample as is on the green.

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To the above reply "Wentworth" replied as follows:

We fear you have misunderstood us in relation to the matter. You have analyzed the cloth, while we wrote asking if you could advise us in relation to the method of the finish on the cloth. We send herewith a fresh sample, and wish you would kindly examine the same and tell us what method has been used to obtain this particular finish, also advise us regarding the method of sizing the same, giving if possible a line on the machinery required to do the work.

To this we replied as follows:

We understood the inquiry correctly, namely that you desired to know how you could obtain the high luster finish possessed by the green sample. You also send us a brown sample, presumably finished by you, which lacked luster and "handle" and which, as you stated, the trade would not accept. We first analyzed and examined the quality of the material in order to determine whether it was possible to duplicate on the brown cloth the finish of the green cloth. In our reply we stated the points of difference and expressed the opinion that it is "useless to try to get the same finish on the brown sample as is on the green." In order to duplicate the finish of the green cloth it is necessary to begin by duplicating the fabric itself. If you do this, you will in all probability be able to finish your goods to match the green finish with the machinery, processes and operatives you now have, assuming of course that you have the ordinary finishing equipment for handling linings. No mistake is more frequently made than to look for the cause of defects in the department in which such defects make their first appearance. A yarn well carded is half spun, and a cloth well made as it comes from the loom is half finished. We frequently hear of changes of machinery, processes and overseers because of imperfect work which was caused not in the department in which the changes were made, but in preceding departments. In your case we feel confident that you will never be able to get on the brown fabric the same finish that is on the green sample. We would advise you not to waste time and money in trying, but to change the cloth itself so it will match the green fabric in quality, twist and construction.

You will find an article on linings in our February, 1911, issue. Bradford, England, is the leading center for the manufacture of these goods and I will ask our English correspondent to investigate the methods of finishing in use there. At the same time I think that your immediate difficulty is in trying to get a finish on a fabric which is not properly manufactured.

Assuring you of our desire to aid you in any way possible, I remain.

Yours very truly,

Editor.

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SCALES USED FOR WEIGHING YARN

Editor Textile World Record:

What kind of scales are used for weighing roving and yarn? Hayes (1920).

There are two kinds of scales used for weighing roving and yarn, and both have commendable features of their own.

In one type the weights are made to be moved along the beam on both sides of the fulcrum, and while one good point about this make is that the weights are not removable from the scales and therefore cannot be lost, there is an objectionable feature in the fact that they do not weigh finer than one-half of a grain. While this will be satisfactory for weighing slubber and first intermediate roving, it would not be accurate enough for getting the correct size of fine roving or yarns, for in this case the scales should be delicate enough to weigh as fine as a tenth of a grain.

Another and more generally used type of scale for weighing all finer roving and yarns has the beam divided into 20 parts, each division representing one grain, and these divisions are sub-divided into ten parts so that it is possible to weigh grains and tenths of a grain. This scale has ten different sized removable weights, the smallest of which is 20 grains, and the largest 3,000 grains, and it is possible to weigh from one-tenth of a grain up to over a pound. There is, however, the annoyance of occasionally having the smaller weights knocked off and lost in the cotton or on the floor, but this slight disadvantage is more than offset by the finer weighings which can be obtained on this make of scale.

Gilbert.

Knitting Department

KNIT GOODS SITUATION

The past month has been an active one in the initial knit underwear market. Buyers have been in the city in great numbers and from the best reports obtainable, have placed fairly large orders.

The annual meeting of the Dry Goods Jobbers' Association was held on the fifteenth at the Waldorf-Astoria, and the banquet was held in the evening and these two gatherings had the effect of bringing many buyers together, and the presence of so many in the city was reflected in the busy appearance of some of the corridors in the buildings at 346, 350 and 366 Broadway.

So far, none of the manufacturers have announced that they are sold up for the season, the nearest approach to it being one who has been offering men's eleven-pound ribbed garment at $3.12 1/2; also twelve-pound at $3.25 and it is said that enough orders have been taken to keep this mill busy for a goodly portion of the year.

One of the matters taken up at the jobbers' meeting was the underwear size scale which some thought should be changed, but after considerable discussion, it was decided that the present scale of sizes could not be much improved upon.

So far the business placed has not averaged as well as last year at this time. Some sellers state they have 90 per cent. of their orders taken, but many admit that 60 per cent. more nearly represents their business to date, so it may be safe to say that probably about 75 per cent. as much business has been put on the books as up to this time last year. It is felt that this is not due to any large stocks of merchandise being carried over, but the shrinkage is accounted for to a greater extent as the evident desire on the part of jobbers generally to play safe and to operate in more of a hand to mouth manner.

There have been quite some reductions in prices made since our last issue. Women's six-pound carded yarn goods have been reduced from $1.75 to $1.70, and seven-pound goods from $1.85 to $1.80. Eight-pound weights, however, have been held at $1.90 and in mentioning this, it might be well to say that all of the eight-pound vests that are being quoted at $1.90 carry with them a pant weighing only about seven pounds.

Women's combed yarn goods to weigh 8 pounds to the dozen that were held at $3.50 last month, have been reduced to $3.37 1/2 and some very attractive stock lots of this class of merchandise have been sold for July delivery as low as $3.12 1/2. Women's combed yarn suits in the same qualities as the above mentioned $3.37 1/2 goods are being sold at $6.50. These are the silk trimmed lines that were held at $6.75 up to within the past month.

The Velvet and Vellastic lines of children's fleeced ribbed goods on which there has been a large sale during the past week have been changed from $1.50 for 16, less 20 per cent. to $1.25 for 16 less 17 1/2 per cent., and the suits from $3.25 to $3.00 on size 2, with a rise of 25 cents. The women's vests and pants of these particular lines that were sold last season at $3.75 are being booked this year at $3.50 and it is pointed out that the business on this class of goods is increasing considerably at the expense of the women's flat fleeced goods, the demand for which has grown smaller.

L. E. Harrower of Amsterdam continues to maintain the price of $3.25 for men's fleeced shirts and drawers, running from 12 1/2 to 13 pounds, but has changed his price on boys' fleeced shirts and drawers from $1.65 to $1.57 1/2 on size 24 with a rise of 12 1/2 cents, and has also changed his price on boys' suits to $2.35 for size 22, rise 25 cents.

The MacKinnon line has also undergone a change in prices and men's fleeced that were held at $3.00 last month have been

reduced to $2.92 1/2, and children's fleeces that were opened at $1.00 are now 95 cents for 16, while the $1.10 grade has been changed to $1.05 for 16, rise 12 1/2 cents.

In the face of these changes, and it must be admitted that prices now being quoted are all very low, there is every indication that all yarn prices will be advanced very soon. It is already apparent that yarn made from good cotton has reached and passed its low level and spinners are beginning to be more firm than for several weeks, and are not hesitating in asking advances from quarter to half a cent per pound on the better grades.

HOSIERY

It was not until after the meeting of the Jobbers' Association that there was any sign of activity worth mentioning in the hosiery end of the market. The impression seems to have gained ground that there was some sort of an agreement among the buyers not to operate until after a certain date, but no positive proof of such an agreement has become apparent. Certain it is, however, that, on account of the lack of orders early in the month, more than one manufacturer began to make price concessions in order to secure some business, and it is said that quite a number took orders at prices at which it will be difficult to figure a margin.

The extreme cold weather during the greater part of the month of January cleaned up stocks of heavy weight hosiery in fairly good shape and many orders came into the manufacturer's hands, calling for immediate delivery, though these were not of large volume.

There has been some softening up of prices in both heavy weight cottons and wools, though no regular reduction that could be noted to apply to the market in general. There are instances here and there of a change of 2 1/2 cents, 5 cents and even as high as 7 1/2 cents per dozen from the early opening prices and it is said that some of these concessions have been withdrawn now that manufacturers have secured a few orders.

Light weights have been quiet during the month, but it is believed that there must be a good volume of business yet to come forward, as the orders placed so far can by no means take care of the demands of the country.

CHEMNITZ MARKET REPORT

At present the hosiery market is in a very peculiar condition. Prices for American cotton have fallen off considerably, but these reductions do not seem to have affected the hosiery market to any extent. Most of the yarn used here is Maco and this grade has not become any cheaper, and the higher grades of American cotton yarn are still being maintained in price. The cost of fine counts of lisle yarns has increased, instead of growing cheaper, as was expected when the season opened.

The orders for the American market are still small and about the only line in very great demand is the light weight gauze goods in plain and mercerized lisles, 39 and 42 gauges. On this class of goods orders have come forward in such volume as to give manufacturers plenty to do for some months to come and as a consequence of this, there have been advances of 5 per cent. to 7 1/2 per cent. in the qualities that were bought to sell in America at about $3.00, with advances of 2 1/2 per cent. to 5 per cent. on the better grades.

Most orders call for a large proportion of black, but white, tan and pearl grey have been selling quite freely.

Lace hose are not at all in demand for the American trade, but some of the other countries are taking such quantities as to take up a large proportion of the output of the lace machinery and the makers are fairly well satisfied with the business they are getting.

Manufacturers of silk hosiery continue to be very busy, but this, however, is only for the home trade.

Split foot hose are being bought more freely than for some weeks past and just at the present time, good values to land in America for 35 cent grades are scarce.

Infants' socks in plain colors with fancy tops have sold in large volume and manufacturers of these have all they can do for some time to come.

Business on men's half hose remains very

quiet and there are a number of stock lots in the hands of manufacturers here.

The glove market is extremely quiet, not only in the American end, but nearly all other markets, as well. A few orders come in from time to time, but the large ones which manufacturers looked forward to in previous years have not made their appearance this year. Indications point to a heavy demand for short gloves for fall and it also looks as if Ringwoods and knit gloves would be in better demand than last season.

THE PRODUCTION OF CIRCULAR SPRING NEEDLE KNITTING MACHINES

BY S. X.

It is customary to express the production in dozens of garments per day. This is a convenient way because the dozen—of No. 40 shirts—is the manufacturers' selling unit.

The production per cylinder is obtained by dividing the total daily production by the number of cylinders in the mill. This gives the commercial production, just what the manufacturer, established or prospective, wants to know, because these are figures from actual practice, and that means that all the conditions which affect the production have been taken into account.

There are a few points regarding this method of getting the production that should be remembered. Suppose a mill manufactures 350 dozens per day and contains 50 spring needle cylinders. The production per cylinder is seven dozens. Now suppose the mill is making 12-pound fleece goods. Then the production per cylinder is 84 pounds. This record in pounds is the rational one, because the cylinder does not produce finished garments. As a rule one cylinder makes the body cloth and a "sleever" makes the sleeves; consequently considering the shirt cylinders, where seven dozens of garments are credited to a cylinder, it actually makes nearly ten dozens of bodies and another cylinder makes the sleeves.

Again, it is assumed that seven dozens of 12-pound goods is 84 pounds, but this weight includes the cuffs which are knit on the cuff frames and should not be credited to the large cylinders. The weight of the cuffs is about .6 pounds per dozen. If this is deducted it leaves about 80 pounds per cylinder as the selling product, but actually the cylinder produced about 84 pounds, of which about four pounds has been cut to waste, while the cuffs just about make this up.

If the product of the mill is composed of piece goods, 84 pounds per cylinder would be the production. If the production is increased by 70 dozens per day, that would mean 840 pounds more, for which ten cylinders could be counted on to produce 800 pounds, and the cuff frames would knit the other 40.

The needle speed and the number of feeds per cylinder are not always alike. If they were alike the production in pounds per cylinder would be the same, regardless of the diameter of the cylinder. This seems strange to those who associate the weight of the production with the diameter of the cylinder, but it is readily realized by considering that if the needle speed is constant the yarn will run into the needles at constant speed; if the number of feeds are alike the weight of the yarn must be the same.

Other things being equal, the weight of the product is, however, proportional to the diameters of the cylinders when the cylinders make the same number of revolutions per minute, because in such a case the needle speed increases in direct proportion with the increase in the size of the cylinder. That is to say, if a 20-inch cylinder knits 100 pounds at a certain number of turns, a 15-inch cylinder making the same number of turns will knit 75 pounds. It is not practicable, however, to run a large cylinder at the same number of turns as a smaller one.

As far as the knitting is concerned, the needle speed decides the number of turns of the cylinder, and once that speed is determined the number of turns should be inversely proportional to the size of the cylinder. For instance, if a 20-inch cylinder making 60 turns has the proper needle speed for that cylinder, then a 15-inch cylinder should make $60 \times 20 \div 15$ turns, or 80 turns.

There are some knitters, however, who cannot let the logic of this overcome their prejudice against running the small cylinders fast, so they content themselves, if not their employers, by a nearly constant number of turns for all sizes. There are also those who find that under the particular conditions of their work high speed on the small cylinders is detrimental, either because of the damage done when smashes occur or for other reasons, and that being the case they are justified in not using high speed. Although this may be the situation in some mills, it is certainly not so in a large proportion of them. In some of the former it is probable that there is a little prejudice mixed up with the objections, because a number of theoretical considerations indicate that even higher needle speed may be used on small cylinders.

As the size of the cylinder decreases the number of needles engaged by the sinker burr decreases, owing to the increased curvature of the needle line, consequently the burr runs more freely in the needles and there is less tendency to overreach. Besides, there being less needles engaged, the yarn is looped into the needles with less stress. This stress on the yarn at the loop wheel is not generally appreciated. It is one of the objectionable features of the loop wheel. Every knitter knows how rapidly the sinker blades wear at the nib. This is partially owing to the concentration of the wear to one locality, but is largely due to the dragging of the yarn across the nib as the yarn enters the needles.

Before the yarn reaches the needle it lies straight across the burr spaces from one blade to the next. The entering needle presses the yarn back into the burr space, and in so doing draws the yarn over the entering blade. This needle continues to draw the yarn until the full depth of the stitch is obtained, and it has to do it against the resistance caused by the needles and blades in mesh behind it. This puts a considerable stress on the yarn.

An idea of this may be obtained by lacing a string alternately over and under the fingers of one hand, holding the fingers together slightly and then drawing the string out across the fingers. It will be observed that by pressing the fingers together to the slight extent the string may be held securely. The case of the yarn entering the needles is similar to this. If the yarn "fills the gauge" the stress is quite likely to break

PRODUCTION OF 20-INCH SPRING NEEDLE CIRCULAR CYLINDER PER DAY.

Gauge.	Stitches per foot of yarn.	Grain, hosiery, weight in grains of 18.75 feet.	Cotton number, balbriggan.	Combined cotton number of face fleece	Needles per inch.	Needle space in inches occupied by 1 ft. of yarn.	Needle space in feet occupied by 1 foot of yarn.	Feet of yarn per pound.	Feet of needles per pound of yarn.	Distance in feet traveled by needles in 20-in. cylinder, 9½ hours, multiplied by 4 for 45, 60, 66 revolutions per minute.	Production.
12	42	15	..	..	7.74	5.43	45	8,750	3,938	537,642	137
14	46	12	..	..	9.08	5.07	42	10,938	4,594	.....	117
16	50	10	..	..	10.41	4.80	40	13,125	5,250	.....	102
18	55	8½	..	..	11.74	4.68	39	15,441	6,022	.....	89
18	56	..	8	..	....	4.77	40	20,160	8,064	788.515	98
20	59	6	..	..	13.06	4.52	38	21,875	8,313	537,624	65
20	62	..	10	.	....	4.75	40	25,200	10,080	788,515	78
20	61	..	..	10½	....	4.67	39	26,460	10,319	716,832	69-125
22	66	4½	..	.	14.30	4.58	38	27,611	10,492	537,624	51
22	68	..	14	..	....	4.73	39	35,280	13,759	788,515	57
22	66	..	..	12½	....	4.58	38	31,500	11,970	716,832	65-118
24	75	..	16	..	15.72	4.77	40	40,320	16,128	788,512	49
24	72	..	..	13½	....	4.58	38	34,020	12,928	716,832	55-100
26	79	..	18	..	17.05	4.64	39	45,360	17,690	788,515	45
28	84	..	20	.	18.38	4.57	38	50,400	19,152	788,515	41

it, or to spring the needles back so that the proper depth of stitch cannot be obtained.

When one reflects that the yarn is sliding ahead over the sinker blades, traveling one and a half times faster than the blades, he understands how it is that they wear out so rapidly. He also understands how it is that the stress on the yarn is decreased by decreasing the number of needles past which the yarn has to be drawn, a result obtained by decreasing the diameter of the cylinder. Consequently, since there is less stress on the yarn and less danger of breaking it, the needle speed on a small cylinder may be higher than on a larger one, for the same number of breaks at the burr. Another reason why the speed may be faster on a small cylinder is that the weight of the rotating parts, cylinder, take-up, roll of cloth, etc., is less than on a large cylinder.

At the present time it is customary to put more feeds on a large cylinder than on a small one. For fleece three feeds on sizes up to and including 16-inch cylinders and four feeds for a 17-inch cylinder and over is the usual rule; for flat work the ordinary range varies from four to nine feeds per cylinder. The average production per cylinder is lowered by the cylinders that are not in use; some of them are almost always stopped for one thing or another; some sizes may be ahead, repairs may be necessary, etc. The knitting machine maker would, of course, want to count out such cylinders in determining the production, but the purchaser would do well not to calculate in this way, for the idle machines are a cause of decreased production. They are some of the barnacles that keep the battleship from running up to her trial speed, but determine what speed can be counted on in battle.

The production, of course, depends on the length of the working day. Generally a ten-hour day is taken as the unit, but this does not mean ten hours actual production. The machine must be oiled and cleaned; stops are necessary to replace needles, tie in yarn, take out the roll, etc. The total amount of lost time depends upon a variety of circumstances. In a go-as-you-please room it may be very large. In a mill where the knitters are paid by the pound it is sure to be quite small.

So far the average commercial production has been considered. As has been stated, this is the manufacturer's figure, the basis of computation for the mill, but it has the disadvantage of being a special figure, not a general one. For instance, in the go-as-you-please mill, the average may be six dozens per cylinder per day, but this figure will not satisfy a prospective manufacturer who means to do business in a progressive way; nor will he always get the figure that he wants from an established progressive mill, for it is probably running a different gauge, on a different scale, and with other conditions different from his requirements.

The information he wants is the actual number of pounds of cloth that comes from one cylinder per day under the conditions of number of feeds, number of yarns, gauge, stitch and speed which he anticipates. Fortunately this information may be determined by anyone who chooses to figure it out. It is not necessary to depend on what some machine manufacturer says, for, although he may be honest, he may be misinformed or he may not know all the conditions.

The method of determining this production is quite simple. Suppose a thread was wound on a large, wide-faced pulley, if it were known how many yards were wound on the pulley and also how much the thread weighed per yard or per number of yards the total weight on the pulley could be determined readily. This is essentially the problem of the knitting machine, with one or two variations.

Take, for example, 28-gauge work, No. 20 yarn, 84 stitches to the foot of yarn, on a 20-inch cylinder running at 66 revolutions per minute. The circumference of the cylinder is 5.24 feet. The travel of the needles in feet per minute is 5.24 by 66, in feet per hour it is 5.24 by 66 by 60, and in feet per day of 9 1/2 hours actual time is 5.24 by 66 by 60 by 9 1/2, which equals 197,128.8, say 197,129. The yarn is No. 20, so there are 20 hanks of 840 yards to a pound. There are, therefore, 20 hanks of 2,520 feet to a pound, or 50,400 feet per pound; if the yarn

were simply wound on a cylinder, we would obtain the pounds of yarn per day for one feed by dividing the needle travel in feet, 197,129, by the number of feet in a pound of yarn, 50,400; but when the yarn is looped in the needles, one foot of yarn takes up only 4.57 inches. Consequently, the number of feet traveled by the needles for each pound of yarn is 50,400 times 4.57, divided by 12, or 19,194. Since the needle travel in feet per day is 197,129, the number of pounds of yarn knit per day will be 197,129 divided by 19,194, or 10.25. This is for one thread or feed. Multiply this by four to get the production per cylinder for four feeds.

The following tables were calculated as follows: A 20-inch cylinder was taken as the basis for the production, and the speed was assumed to be 45 turns for wool, 60 for backing cloth, double cotton face, and 66 for balbriggan. It is not to be inferred that these are given as the correct speeds or the average speeds; different circumstances require different speeds; one manufacturer believes in low, another in high and a third in moderate speed.

These figures are given as fairly representative. If they are high or low the tabulated production may be proportionately modified. Nine and one-half hours is taken as the actual running time. The backing cloth figures are obtained primarily from the weight of the face, to which 82 per cent. is added for the backing. The figures on which this table is based are taken from actual practice.

The first column gives the gauge, the next four columns and their headings give particulars of the stitch, yarn and kind of fabric; the last column gives the production per cylinder, revised in the fleece cases to give the combined weight of face and back. The other columns give figures used in calculating the production, and will be of value to those desiring to make similar calculations for conditions differing from those assumed.

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The ribbon production of St. Etienne in 1910 was $18,930,651, a decrease of $202,585 compared with the figures for 1909.

MANUFACTURING KNITTED NECKWEAR

BY LARAMIE

In the manufacturing of knitted neckwear we obtain a larger production from a certain number of machines than is obtained with any other article. One machine with a cylinder of 49 needles will average ten dozen ties a day providing the yarn is of good quality. One dozen ties can be pressed in two minutes, the finishing requiring about three minutes. Pulling in the ends, which is the most difficult operation, requires about five minutes for a dozen ties. In making neckwear on machines of 49 to 70 needles pattern wheels are generally used. The chain which regulates the length of the ends and the neck also operates the tucking cams. At the end of the short end of the tie the tucking cams so operate as to make a plain stitch for the neck-band, which is naturally narrower in width than when making the short and long end of the tie. When the tucking cams are not working only the pattern wheels are casting off the stitch. Accordingly a ten-gallon boiler is connected with a gas heater underneath. A pipe about three feet long is connected with a stand carrying a piece of brass pipe with two slots about an inch and a half on the top and an inch from each end. Through these slots the steam is allowed to pass. At one end of the steam pipe there is a hole or stop cock which will drain off the waters of condensation.

After the steam is coming through these slots the neck band of each tie is pulled out by the operator and then passed over the steam pipe, first one side of the band being treated and then the other side. This is practically all the pressing that all silk ties require.

Wood or fiber silk ties should be passed lightly over the steam without bearing down on the pipe.

In making accordion knit neckties on 100-needle cylinders the tucking cams are not used because the plain stitch on these ties would be wider than the accordion, as the latter is made with a long butt and a short butt needle alternating. On one feed the short butt needles are held down by a cam and only the long butt needles take the

stitch. On the other feed all the needles take the stitch, hence it is necessary to make the neck of finer silk. The machines are made to stop in order to cut out the heavy silk and to tie on the finer silk for the neck. These ties are then pressed in the ordinary way.

When knitted neckties first came out they were all finished by hand sewers, who unraveled the end of the tie the required amount of stitches and ran a thread through the stitches, sewing each end. This required a number of girls and was a very slow process, so it was not long before a machine was built to do this work. Now the ties are practically all sewed up by machine. An average of 2,000 ties can be run off in a day. After the machine sews up the ends two or three girls are required to pull in the ends by using an ordinary latch needle, running it up through the side of the tie and pulling the end left by the machine into the inside of the tie.

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IMPORTANT PATENT LITIGATION AGAIN DECIDED IN FAVOR OF SCOTT & WILLIAMS, INC.

It will be remembered that some months ago a notice of the decision rendered by Judge Day of the Circuit Court for the Northern District in New York was handed down and reported at that time in this journal.

This decision sustained the contention of Scott & Williams and the General Knit Fabric Co., that certain machines and fabrics of the Steber Machine Co., Utica, N. Y., infringed the patents covering the manufacture of Interlock underwear.

The defendants in this case appealed to the Circuit Court of Appeals, which is a court of last resort in patent matters. A decision from this court has recently been handed down, which fully sustains the contention of Scott & Williams, that the Interlock patents were valid and were infringed by the Steber machine and the resulting fabric.

The following extract is taken from the decision of the Court of Appeals.

"The fabric is uniform throughout. It is new, useful and ornate. It is used principally for underwear and presents a soft, velvety surface to the skin, adding additional warmth without increasing materially the weight of the fabric. It has become increasing popular with the knit goods trade and the public. The reason for this popularity is neither fanciful nor visionary. Unquestionably the patented Interlock fabric is more elastic than prior fabrics intended for winter wear, while equally smooth to the touch, both sides being alike in-so-far as the smooth, velvety feel is concerned.

"We cannot avoid the conclusion that the defendants are attempting to appropriate the advantages of the Scott fabric and seek to avoid infringement by the introduction of an unimportant additional feature."

Scott & Williams have been remarkably successful in the prosecution of their patent infringement cases, probably because they give most careful consideration and investigation before proceeding, with the result that when they have satisfied themselves of the outcome, their judgment has usually been sustained by the Court.

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THE JOHNSON CLOSED CROTCH UNION SUIT

H. G. Johnson, of Kenosha, Wis., has invented and patented a closed crotch union suit. This patented garment has a permanently closed crotch just like a pair of drawers and the opening running down into one leg, which is the patented feature, gives an opening large enough to be practical, yet simple to manipulate and one that will not gape to expose the person no matter what the position of the wearer.

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According to Census returns, the growth of the silk manufacturing of the United States has been as follows: 1900, $107,250,000; 1905, $133,250,000, while it is estimated that the returns of production for 1910 will run considerably over $150,000,000. The number of silk establishments has increased from 67 in 1850 to 624 in 1905.

A PATTERN MECHANISM FOR KNITTING MACHINES

This pattern mechanism is adapted for straight knitting machines having two parallel rows of needles, the object being to have the needles controlled by the cylinder. Fig. 1 is a cross section showing the needle mechanism and a portion of the pattern cylinder. Fig. 2 is an enlarged view of the same parts, but in a different position. Fig. 3 is a plan of the cylinder. Fig. 4 shows one of the vibrating levers. Fig. 5 is an end elevation of the improved knitting machine. Fig. 6 is an inside view of the switch wheel controlling the pattern cylinders.

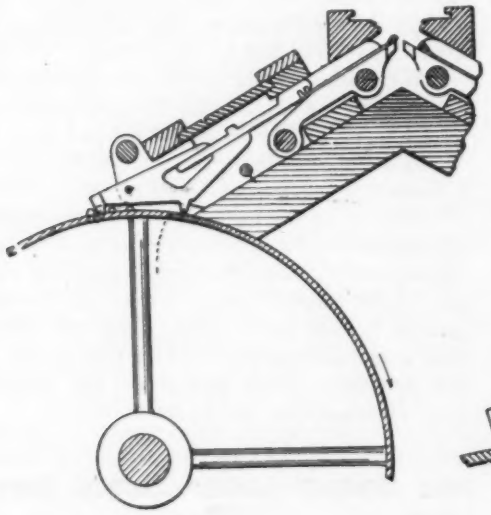

FIG. 1.

FIG. 4.

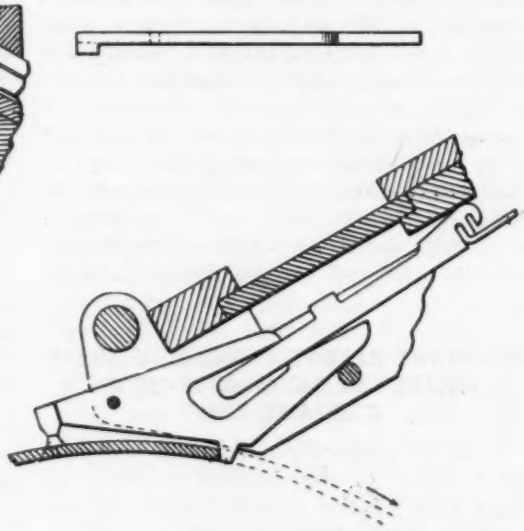

FIG. 2.

The needles are supported in the beds upon bottom plates arranged edgewise immediately below them, and which, along with the plates, are confined between wall plates. Above each needle is a filler plate also arranged edgewise between the wall plates, and a preventing vertical movement of the needle. The wall plates are held in position by their entrance in traverse grooves formed in the needle bed. The needles are brought into acting position and withdrawn by jacks, the upper ends of which have notches adapted to engage the turned up lower ends of the needles, as shown. The jacks have lugs on the upper edges. These lugs are engaged by the cam devices on longitudinally moving cam bars, traveling in ways formed in the supporting bed and are actuated longitudinally by the cam bars so that they carry the needles into and out of acting positions.

The pattern cylinder is a stationary cast cylinder adapted to rotate, the operating parts of which are located at and near its end. Those parts of its periphery at which the needles should move into non-acting position are cut away, giving the end of the cylinder a stepped formation so that the remaining parts of the cylinder are very light in weight as compared with previous constructions. The cylinder is adapted to act on the vibrating levers in such a manner as to cause the lifting of the jacks so as to bring their lugs into the path of the cam devices, and also to lower the jacks so as to withdraw them from engagement with the cam bars. The jacks are free to move longitudinally in the levers, so that the cams can slide the jacks upward or downward, and thus project the needles into acting position or withdraw them to normal position. The levers are supported at each side by the wall

plates, and are pivoted so that they will lift or depress the jacks. The pivot is located nearer one end of the lever than the other

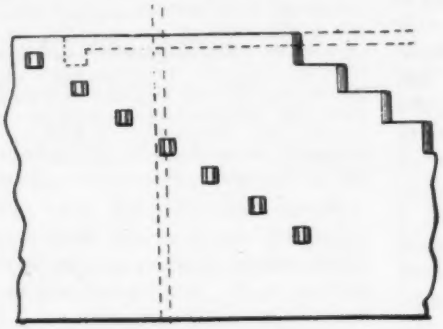

FIG 3.

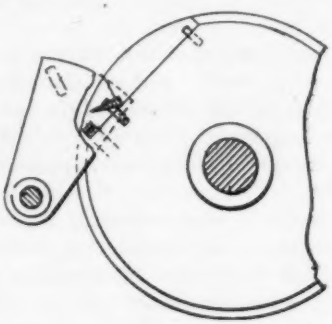

FIG 6.

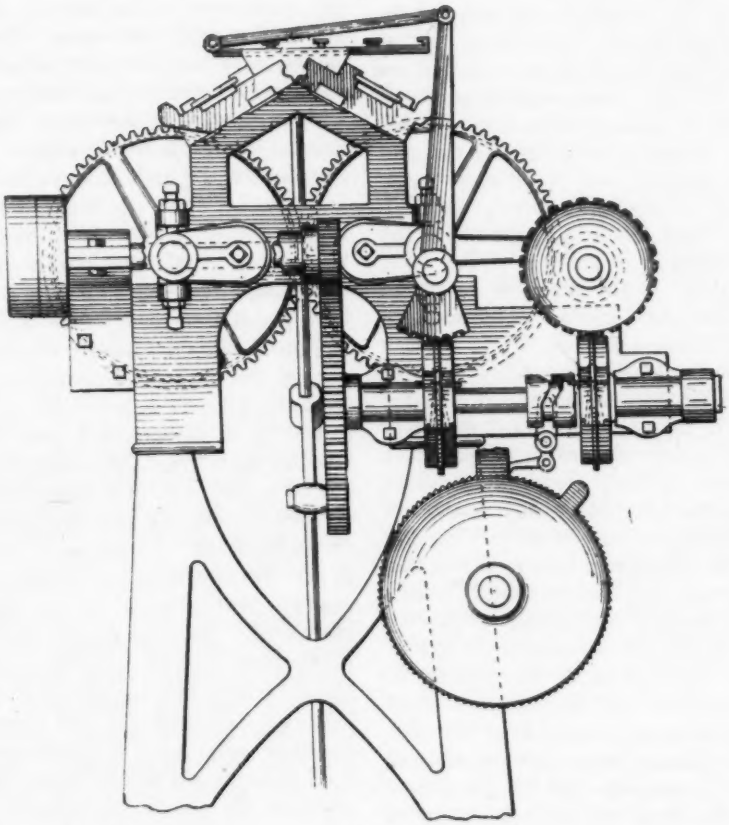

FIG 5.

in order that when the latter has fallen to its lowest position its weight will prevent rising, and also in order that the riser may be made short and still produce the necessary amount of movement at the long end of the levers, and allow the pivots of the levers to be located near the periphery of the cylinder.

The levers have each two downwardly projecting points or feet, one located at the side

of the lever and at the initial or forward end of the same, and the other under the body but at the opposite side of the pivot. Both feet are beveled at their forward and also at their back faces, so that the feet will ride over the risers, whether the cylinder is moving forward or back, and so that the feet after having passed off the surface of the cylinder will again be lifted upon this surface at either the forward or back movement of the cylinder.

The cylinder is provided with a series of risers or buttons so located that they pass under and lift the feet of the levers a short distance above the cylinder surface as seen at Fig. 2. This operation is coincident in the case of each lever with the passing of the foot of the lever over the step, that being the point at which the cylinder is cut away so far as it controls the lever. The lifting of one foot and the stepping off of the other allow the lever to rock from the position of Fig. 1 to that of Fig. 2. This results in depressing the jack so it cannot be acted on by the cam bar. In this position the lever rests upon the rod which passes transversely through the wall plates, and acts as a stop to limit the downward movement of the lever. The lever and jack continue in the position described until the cylinder has moved far enough to bring another acting portion of its surface under the lever. When this occurs the feet will both slide on the surface of the cylinder and continue in that position until the riser and step again appear or another similar riser and step appear in their stead, and causes the rocking of the lever as already described.

The lever is shown with both feet on the solid part of the cylinder in Fig. 1, and in this position the lever is raised so that it brings the jack into position for engagement with cam bar and continues the needle in action until the riser and step cause the rocking of the controlling lever and the withdrawal of the jack. The pivot is located near the pattern cylinder. The pattern cylinders are rotatable in both directions, and lift the levers when moving back as well as when moving forward. The cylinders are supported on shafts and are provided with intermeshing gears so that they move together at all times.

FORMIC ACID IN CHROMING HOSIERY

Editor Textile World Record:

In mordanting with bichromate on cotton hose we use 7 per cent. chrome with water only, not using any acid, but our superintendent claims that we could save a considerable quantity of the chrome by using sulphuric acid. Our dyer claims, however, that the use of sulphuric acid tenders the goods, but we are told that formic acid acts the same as sulphuric acid without tendering the goods. We would like to know if it would be advisable to use the acid and also the proper quantity of chrome to use. Comber (1970).

From this inquiry we presume that "Comber" has in mind the after-chroming of black cotton hosiery which has been dyed aniline black. He says he now uses 7 per cent. of chrome with water only, not using any acid. It appears certain that a considerable saving in the quantity of chrome could be made were it possible to use an acid in connection with the same. The use of sulphuric acid has been very generally the custom in this connection, although there is a danger always present of tendering the goods; though if the sulphuric is used properly and the goods are washed thoroughly and soaped after the treatment and before there is any chance of any portion of them to become dry, the tendering from acid would not be a very liable fault. However, it is possible to use formic acid in place of sulphuric with practically no danger of tendering the goods. Formic acid is now a commercial article and can be readily obtained at a price which will make it permissible to be used. I would recommend the use of 4 per cent. of chrome and 4 per cent. of formic acid (85 per cent.) for the after-chroming bath. Formic acid is a strong acid in the sense of its acid reaction and can very readily do the work of the sulphuric acid chemically. It also enjoys the property of being quite volatile, so that even though the goods do dry, this acid will not cause tendering, as its evaporation will eliminate it from the fiber, whereas if sulphuric acid had been used evaporation would merely serve to concentrate the acid in the goods until by the time they were fairly dry the acid would have become of such strength as to rot the cotton.

J. M. Matthews.

Dyeing, Bleaching, Finishing, Etc.

PRACTICAL DYEING

SILK AND ARTIFICIAL SILK

BY RENMARK

The most valuable of the textile fibers is silk, a substance secreted by the silk worm as a colorless, sticky liquid, but which solidifies in contact with the air, and with which the silk worm surrounds itself when going into the chrysalis state.

The loss in weight in degumming silk amounts to about 25 per cent. and this loss is generally made up by "weighting" the silk, the most commonly used chemical for this purpose being double chloride of tin. The silk is treated one hour with this chemical, the density of the bath being about 45° Tw. It is then rinsed and run 1/2 to 1 hour in a warm bath of phosphate of soda 6° Tw. Rinse again and treat in an equally strong bath of silicate of soda. Rinse again and repeat two to five times according to the weighting required. In dyeing silk black with logwood and iron the above weighting is not necessary, as logwood and iron give to the silk the necessary addition in weight.

In order to impart to silk the familiar crackling sound, it is scrooped or, in other words, is passed through a weak solution of acetic or tartaric acid and dried without being rinsed. About 5 per cent. of acid should be sufficient to give the desired feel, but more or less can be used according to conditions.

Instead of the harsh feel of scrooped silk, it is sometimes desired to soften the silk. This can be easily accomplished by making an emulsion of sulphuric acid and olive oil, stirring constantly during the addition of the acid to the oil. Dilute with water and turn the silk in this liquor for 15 or 20 minutes, drain and dry without washing.

Another method is to treat the silk about 1/2 hour in a bath of pulverized fuller's earth. Wring and let lie for several hours, after which wash carefully and dry. If not soft enough repeat. The silk should be stretched and pinned before drying. This is done by twisting it on a wringing post with a wooden pin or by using machines made specially for this purpose.

In order to import a high luster to silk it is stretched between two horizontal rollers enclosed in a small space into which steam is admitted under slight pressure. The rollers are turned slowly and drawn apart until a certain tension is reached. The silk should be perfectly dry before being subjected to this operation.

Silk is a very poor conductor of electricity, but becomes easily electrified by friction, and this would cause trouble in the manufacture if the rooms were not kept in a moist condition by artificial methods.

Effects of Acids:

Concentrated mineral acids rapidly destroy the silk fiber.

Concentrated muriatic acid will dissolve more than its own weight of silk, the result being a transparent, sticky paste. By addition of alcohol a precipitation is caused.

Muriatic acid gas also destroys silk but does not liquify it.

Nitric acid dissolves silk, forming a yellow solution. This test is very useful to determine if a fabric contains silk.

Acetic, tartaric and sulphuric acids are used on silk to produce the peculiar crackling sound known as scroop. Tartaric acid produces the most permanent scroop owing to the fact that acetic acid disappears by evaporating.

Effect of Alkalies:

Potassium permanganate turns the silk fiber brown, but this can easily be removed by a subsequent treatment with a weak solution of bisulphite of soda. Silk stained by different dyestuffs, either in dyeing or scouring, can often be cleaned by applying a weak solution, about 1 per cent., of permanganate

of potash for 15 minutes, wash and enter into a similar strength solution of bisulphite of soda.

Chlorine if used in a strong solution will destroy silk, but in a dilute cold solution does not injure the material.

Potassium bichromate turns silk yellow, but as silk does not retain this chemical with any degree of tenacity it is not suited for a mordant.

Chromic acid in a strong solution destroys silk by dissolving the fiber.

Effect of Metallic Salts:

Silk readily absorbs metallic salts.

A very good method for dissolving silk and one which will not injure cotton or wool is as follows:

Fifteen parts of sulphate of copper are dissolved in 140 parts of water and to this solution is added 9 parts of glycerine. Then add caustic soda solution until the precipitate formed is redissolved. Several experiments have shown that 28 parts of a 30° Be. caustic soda solution was necessary. The silk is dissolved completely and quickly. If cotton and wool are present neither is injured, the cotton being left white, but the wool assumes a dark brown color, which can easily be removed by applying a dilute solution of muriatic acid.

Silk will absorb the acid, basic or benzidine colors without the use of a mordant, and generally speaking the color does not become permanently fixed on the fiber, but can easily be washed off. There are, of course, a number of exceptions to this rule.

WILD SILKS

Several grades of wild silks are in common use, the most important being tussah, which comes into the market in the reeled state, or as spun silk, and is imported from India and China. Tussah silk has a very heavy brown color, is full of impurities and the fiber is about three times as large as ordinary mulberry silk. In addition to this, instead of being round it has a flat double fiber. This flatness imparts to a fabric made of Tussah silk a peculiar sheen owing to the reflection of the light rays. Tussah silk material appears rough and full of what look like knots. Tussah silk is degummed by being worked 1/2 hour in a bath containing 10 per cent. soda ash, at 110° F., then in a second liquor made up of 30 per cent. soda ash for 1 hour at a temperature of 140° to 180° F. It is next rinsed and soured with 8 per cent. muriatic acid 1/4 hour cold, washed and dried.

The characteristic brown color is very difficult to remove. This can be accomplished only by bleaching, the best chemical to use being sodium or hydrogen peroxide in the following proportions:

Hydrogen Peroxide: 1 gal. in 10 gals. water.

Sodium Peroxide: 4 lbs. in 200 gals. water.

Sulphuric Acid: 4 lbs.

Immerse the silk, handle a few times, cover up the bath and let stand four hours at 120° F.

Effect of Alkalies: Tussah silk has a much stronger fiber than ordinary silk and resists the action of alkalies to a much greater degree. While a 10 per cent. solution of caustic soda at a boiling temperature will quickly destroy ordinary silk, it takes it a long time materially to affect tussah.

Effect of Acids: The same remarks apply as for alkalies. White muriatic acid quickly dissolves silk forming a yellow solution; even if left in the solution for 24 hours tussah is only partially dissolved.

Chromic acid will quickly dissolve silk, whereas it acts on tussah very slowly.

Tussah silk is more difficult to dye than ordinary silk owing to the fact that it does not readily take up color and that it is difficult to obtain good blacks on account of the way its flat fiber reflects the light, causing the material to have an uneven, glossy appearance.

ARTIFICIAL SILK

This is a textile fiber which is not in the least, chemically speaking, what its name would naturally imply, i. e., it is not in any way related to silk except in luster. Artificial silk is a vegetable fiber composed of cellulose and in dyeing it behaves like cotton, with the

exception that it will take up the basic colors without a mordant.

The copper sulphate solution which dissolves silk will not attack artificial silk. This method can be used to distinguish the real and artificial silk.

Following is a method for destroying artificial silk: Put into an oven having a temperature of 400° F. for 10 minutes. This will cause the artificial silk to crumble and it can then be rubbed or beaten out of the fabric, disappearing as dust.

PEROXIDE BLEACHING FOR KNIT AND MIXED GOODS

BY SARAWAN

The advantages of peroxide are now so well understood that they need not be emphasized. There are, however, some conservative manufacturers who have held back for fear the cost would be prohibitive. They concede that the white is as good as that obtained with lime; that softness and elasticity are much better; that as to strength of fiber of the goods bleached the peroxide is in a class of its own and cannot be compared to the "chemic," the chlorine of which begins its rotting action in the vat and continues it on the shelf. They are furthermore ready to acknowledge that the peroxide white is permanent, in distinction to the chlorin or sulphur whites which yellow-up quickly, and that the odor of the former reminds one of the fields and forest, while chlorine smells of chemicals and sulphur, indeed, of the barn yard. Yet, they are not willing to allow that all these advantages are the very ones which the public desires and for which it would willingly pay an advance to secure them. One of the best arguments to substantiate this latter view is found in the analogous case of the "guaranteed" lines, even though their basis is at times the wrong one. They proceed from the view that the consumer is willing to pay for "quality." They charge much higher prices for goods, so manufactured that they can be guaranteed to outwear the customary run of these products. As the public has been humbugged so often by honestly sounding, but unfounded claims, the "guarantee" had to be made good by replacing such of the goods which failed to reach the time limit set. Let us examine the cost question of the peroxide bleach. We must at the very beginning be sure of the total cost of the chemic bleach. To treat a garment, composed in part of wool and in part of cotton, with sulphur is to damage the goods by carbonizing the cotton part, thus offering to the buyer an inherently defective, yet outwardly perfect article, at full value. Sulphur bleaching on all-wool goods does not damage the fiber, but on the other hand it is not stable, the white changing to its former yellow. This is due to the fact that the sulphur has deoxidized the coloring matter, which, when exposed to the air, is reoxidized. This phenomenon accounts for the lifeless, dirty yellow appearance of bed blankets and woolen underwear and of serge and flannel dress goods. It is readily overcome at very small additional expense, if any, by peroxide bleaching. With both old style systems, chemic and sulphur, a certain percentage of the goods are damaged in the process of bleaching, due to causes frequently unavoidable. If not noticed this creates dissatisfaction with the buyer, causing loss of trade. If noticed, the goods are cast aside, resulting in a loss, which remains more or less constant and must therefore be considered in the cost calculation. Some of the goods come from the bleach uneven, streaky and spotted, and are twined into darker colors, causing a loss which is frequently increased by an attempt to remedy the difficulty by further bleaching. A third item of cost is the return of goods, stocked too long by the purchaser, and which have become unsalable by a change in the color. When we estimate the cost due to these causes, as every mill should do, but rarely does, we arrive at a surprisingly high cost for bleaching by the old process. On the other hand in peroxide bleaching practically all these causes of additional cost are absent. The cost of chemicals and labor which the peroxide recipes call for include all of actual and contingent expenses.

STEAM FOR DYE HOUSES

Fitchburg, Mass., Jan. 16, 1912.

Editor Textile World Record:

We have read with interest the article on page 131 of the January issue pertaining to steam supply to dye houses, and quite agree with "Beta-Naphthol" that in a good many cases it is not necessary to cause the water to boil. We have found in many cases that good results may be obtained at a temperature of 210°. In the second paragraph of the January article is one statement to which we cannot agree, that is, that next to an ample supply of water comes a supply of live steam and plenty of it. We see no reason why the steam consumption should vary but very little the year round if exhaust steam from engine may be utilized in the dye house. While steam at 80 lbs. and 40 lbs. has 1,177 and 1,163 b. t. u. respectively, you will find that steam at 5 lbs. pressure has 1,151 b. t. u. per lb. This is a great reduction in pressure, but a very slight reduction in heat units per pound of steam. Our experience with many dye-house piping jobs has been that the efficiency of the entire plant is greatly increased by using exhaust steam from the engine. In many cases we have shown a decided increase in economy by disconnecting the condenser and utilizing the exhaust steam from the engine at the pressure of about 5 lbs.

This, of course, makes of the engine a large reducing pressure valve capable of supplying dye house and heating system with steam at a uniform pressure. We have found that with this arrangement we not only get more uniform results in the dye house, but in many cases are able to bring the dye bath to a boil in a shorter period than when live steam is used. We have always accounted for this from the fact that less of the energy of the steam is used in blowing the water away from the inlet pipe and a better mingling of steam and water results. It would seem to me also that the difficulty mentioned regarding inequality of shade is less likely to occur with steam at a lower velocity of pressure. The use of exhaust steam in dye houses was for many years considered impracticable because of the effect of cylinder oil carried with the exhaust steam upon the goods in process. This objection has been mentioned to us several times and we are firmly convinced that were it not for this feature many manufacturers would have made the attempt to utilize the exhaust for this purpose.

I can truthfully state, however, that by the use of the proper kind of oil and with the installation of an efficient separator, together with scientifically designed piping, the use of exhaust steam in dye houses is practical and has been adopted by many of the representative woolen manufacturers of this section.

Yours very truly,

H. M. Parks.

NEW SPECIFICATION FOR BLEACH

A novel specification for bleaching powder has been proposed by a committee of the American Chemical Association headed by H. J. Skinner, of Arthur D. Little, Inc. A basis for price is proposed as bleach containing 35 per cent. of available chlorine. A minimum of 31 per cent. is fixed, and factors are given for determining the deductions or additions to be made for chlorine content above or below the standard 35 per cent. The detailed specification says:

General Description.—The material desired under these specifications is bleaching powder or calcium hypochlorite, prepared by absorbing chlorine in slaked lime. It must be white in color, fresh and dry.

Requirements.—The bleaching powder supplied under these specifications must test as follows:

1. It must contain not less than thirty-one (31) per cent. of available chlorine.

2. It must settle readily and completely when mixed with water. If lumps are present, they must break down and leave no core.

Basis of Price.—The base price per ton-unit named in the contract shall apply to bleaching powder containing 35 per cent. of available chlorine and is represented in the table below as "1.00"; for variations from 35 per cent. in the average of the whole ship-

ment, bonuses and penalties shall be applied as per table, provided the strength of no single package varies more than 1 per cent. from the average of the whole and in no case falls below 31 per cent., otherwise, the entire shipment is to be at the disposal of the contractor or accepted under such terms as may be agreed upon:

% available Chlorine	Price to be paid per ton unit for whole lot
31	base price x 0.74
32	base price x 0.82
33	base price x 0.89
34	base price x 0.95
35	base price x 1.00
36	base price x 1.04
37	base price x 1.07
38	base price x 1.09
39	base price x 1.10

DYEING TAGAL HEMP

Editor Textile World Record:

How can I get fast colors on tagal hemp?

Manson (1979).

The term "Tagal Hemp" is one of many appelations given to certain vegetable fibers related to the true hemp and which are natives of Japan, China, the Philippines, Java and adjacent localities.

So-called "Tagal Hemp" lends itself admirably for the manufacture of braids for hat making, also on account of its peculiar luster, pliability and ready absorption of color. As a rule it is generally dyed in braid form.

For the production of clear, bright shades, the braid should be previously bleached with peroxide of hydrogen in preference to any other bleaching agent, as attempts to bleach bast fibers with bleaching powder are not entirely satisfactory when carried out by those unskilled in the art of bleaching, therefore the safer, though longer method is always best suited.

For bright shades the basic dyes are generally used, but they have the disadvantage of yielding shades that are not particularly fast to either light, weather, exposure or washing. The acid colors, except in very few instances, are not available for this class of work. The best suited colors are of the direct or diamine group and which are applied from a neutral bath containing for medium shades from 2 to 5 per cent. of common salt, and 2 to 3 per cent. of soda ash; where particular softness is desired, there may be added to the bath from 1/2 to 1 per cent. Turkey red oil.

Light shades and tints on Tagal Hemp braid can be dyed without salt, but adding 1 1/2 per cent. of soda ash, and 1 per cent. of Turkey red oil to the bath. Dyeing proceeds slowly for one hour at the boil. Light shades may be lifted from the bath as soon as the bath appears to be exhausted.

Direct dyeings such as above described possess normal fastness, but for certain purposes increased fastness is absolutely necessary, and which is obtained by using the well known process of aftertreatment with metallic salts. The aftertreatment consists of passing the dyed braid through a second and separate bath containing from 1 to 3 per cent. of bluestone and 2 to 3 per cent. acetic acid for half an hour, the bath being heated to about 160° F. While the shade may be altered slightly by such treatment, the resistance to light and washing is greatly increased.

According to the nature of the diamine color used, aftertreatment with bichrome may have an advantage. The formula is as follows, according to depth of shade:

1 to 2% Bichromate of Potash (or Soda).
1 to 2% Bluestone.
2 to 3% Acetic Acid.

This bath should be boiling.

Sometimes chrome alum and chromium fluoride are used, but every practical result may be secured by the recipes above given.

For certain cases Tagal Hemp braid and similar bast fabrics requiring extra fastness, particularly for dark blue and blacks, are successfully dyed with the diaminogene blues, diazotized and developed with beta-naphthol, while for blacks, diaminogene B, diazotized and developed with phenylene-diamine or dihydroxy-benzene.

Dyeing by this process is very simple. The unbleached material is dyed with the colors above mentioned, with a small amount of common salt in the usual manner. The dyed material is then washed and passed through a second cold bath containing 2 1/2

per cent. of nitrite of soda and 7 per cent. of muriatic acid for half an hour. Lift, rinse and pass for half an hour through a developing bath prepared with beta-naphthol to develop the diaminogene blue, or with phenylene-diamine or dihydroxy-benzene to develop the diaminogene B for black.

After development, the braid is lifted, washed thoroughly and preferably air dried, although drying in a current of moderately heated air is quite permissible, but it should be remembered that all bast fibers are permanently injured if dried rapidly in a superheated atmosphere.

Louis J. Matos.

STAINED SILK IN WHITE SILK EFFECT WORSTEDS

BY RENMARK

A manufacturer making worsteds which contained a white silk stripe, complained that much trouble was being experienced on account of the white silk becoming stained, and stated that they were using the same colors, method and material as in the past and therefore could not account for their present difficulty.

After looking over conditions in general and examining the material, and not finding anything wrong, I tested the dyestuff and found it up to the standard. A dyeing was then made under my supervision and the result was the same as the dyer had been getting, the silk was badly stained.

Next the chemicals were analyzed and found satisfactory with the exception of the acetic acid which contained a trace of sulphuric, but not enough to cause the trouble in question.

The only thing to do then was to examine the material. In order to do this properly I went back to the laboratory to carry on my experiments, as greater accuracy could be obtained there. The mill had been using the chromate process, which means that the color, chrome and acid are all added at the start.

In dyeing worsteds containing white silk, if it is desired to leave the silk white, it is necessary to use certain colors which experience has shown will produce the result wanted. It is obvious that these must have very little affinity for the silk fiber, but a great affinity for wool, and it is due to the excessive drawing power of the wool that the silk is robbed of the color.

When examining a dyeing on silk effect worsteds after using the proper colors and method, it is found that when the bath is cold the silk is stained very decidedly, the wool remaining nearly white. At 140° F. the wool begins to take the color and the silk absorbs still more. At 180° F. the wool has more color than the silk, which is beginning to lose the color it took up. At the boil the silk has very little color, while the wool is taking the color rapidly. Continued boiling causes the silk to lose all its color and become white.

To come back to the trouble the mill was having, my experiments proved that the wool the mill was using was a very inferior quality and would not absorb the color as it should and on this account the color was left in the bath and of course went on the silk. On account of the chrome being in the dye bath at the start the exhaustion of the bath is slower, due to the chrome causing a decreased affinity on the part of the wool. I tried dyeing the mill's material with the after-chrome process, that is, adding the chrome after an hour's boiling with the acid, and obtained encouraging results. A trial of this method at the mill produced perfectly white silk effects on the material which had been causing so much trouble.

CHARGING FOR BLEACHING BY THE YARD

Editor Textile World Record:

Will you kindly favor us with an outline of the method followed for charging bleaching work by yardage? Bennett (1963).

There are a variety of methods of charging for bleaching. Some firms charge by what is called the straight yardage, that is, 1/2 cent per yard, 1/4 cent per yard, 3/8 cent per yard, or 1 cent per yard as the case may be. These charges are always based on the amount of work that is required in the finishing of the goods, as some goods require more work than others for producing a certain finish. Whether the charges are made

by the yard or pound, the results are the same in the end. We will take the following illustration, a commission bleacher takes a given number of yards of cloth to bleach and finish, say 100,000 yards at 60/100 cents per yard, 64 by 72, weighing 5 yards per pound and to finish 36 inches. When this is finished and returned it will net the bleacher $600.

Another bleacher takes the same lot, charging by weight, that is, 100,000 yards of goods at 5 yards per pound would give 20,000 pounds. His charge of 3 cents a pound would result in $600 for the work. This shows the actual cost for commission bleaching. The bleacher returns the number of yards received and keeps the gainage in remnants which generally runs from 1 1/2 per cent. to 2 1/2 per cent. or sometimes as high as 3 per cent., which he disposes of to the best advantage. Some bleachers will guarantee a certain percentage of gain on the work they take, the charge being at a higher rate for bleaching and finishing. In cases where it is not a standard finish and a new finish has to be obtained, the manufacturers should send samples to the bleacher along with his pattern. When the goods are finished to the pattern submitted the prices are quoted in accord with the amount of work put on the goods to obtain the required finish. In England the price is generally quoted on the piece or lump, as they are called. A manufacturer will send to a bleacher, say 100 lumps of 40 yards at 10d. per lump, which is equal to about 2 yards for one cent, or 200 lumps of 40 yards at one shilling per lump. The above is just an outline of the manner in which the charges for commission bleaching is made; sometimes there are allowances to be made for one thing and another, such as various kinds of finishes which entails more work, a little change in the folding and stamping, or a different way for boxing the goods. Delco.

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The total value of goods exported from Huddersfield to the United States during August was $67,487.28, a decrease of $21,473.29 compared with the corresponding month of last year.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 17

RED ON WORSTED YARN

Brilliant Lanafuchsine G G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Brilliant Lanafuchsine G G. (Cassella Color Co., 182 Front St., N. Y.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour. Brilliant Lanafuchsine G G possesses excellent fastness to light, alkalies, stoving, and steaming.

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Recipe No. 18.

VIOLET ON WORSTED YARN

Oxy Chrome Violet 2 R O on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Oxy Chrome Violet 2 R O. (Geisenheimer & Co., 189 Front St., N. Y.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter at 120° F., and dye at a boil for 1/2 hour. Then exhaust the bath by adding

2 lbs. Sulphuric Acid.

When exhausted, after-chrome in a bath, for 3/4 of an hour, made up with

2 lbs. Potassium Bichromate .

Oxy Chrome Violet 2 R O possesses the characteristic fastness of the after-chromed colors.

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Recipe No. 19

RED ON COTTON YARN

Benzo Fast Red 8 B L on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Benzo Fast Red 8 B L. (Farbenfabriken Co., 117 Hudson St., N. Y.)
30 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour. Benzo Fast Red 8 B L possesses excellent fastness for a color of this type.

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Recipe No. 20

BLUE ON COTTON YARN

Rhoduline Blue G O on 100 lbs. cotton yarn. First mordant the cotton in a bath made up with

2 lbs. Tannic Acid,

entering at a boil, and working at this temperature for 1/2 hour, allowing to cool for several hours, or over night, in the bath. It is then wrung without rinsing, and worked for 20 minutes in a cold bath made up with

1½ lbs. Tartar Emetic.

The material thus mordanted is then dyed in a bath made up with

2 lbs. Rhoduline Blue G O. (Farbenfabriken Co,. 117 Hudson St., N. Y.)
1 lb. Acetic Acid.

Rhoduline Blue G O gives a clear greenish blue shade possessing good fastness to chlorine, washing, and light.

Recipe No. 21

BLACK ON COTTON YARN

Develop Black No. 7504 on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Develop Black No. 7504. (Innis, Speiden & Co., 46 Cliff St., N. Y.)
20 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour. Lift, rinse, and then diazotize in a cold bath containing

3 lbs. Sodium Nitrite,
6 lbs. Sulphuric Acid,

working for 15 minutes. Lift, rinse again, and then develop by working for 15 minutes in a cold bath made up with

1 lb. Meta Toluylene Diamine.
½ lb. Soda Ash.

Develop Black No. 7504 is especially adapted for the dyeing of hosiery, and fabrics containing cotton and silk mixtures, dyeing both a uniform shade.

Recipe No. 22

BLUE ON WORSTED YARN

Patent Blue A New on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Patent Blue A New. (H. A. Metz & Co., 122 Hudson St., N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Patent Blue A New is notable on account of its great purity and solubility.

Recipe No. 23

BLUE ON COTTON AND WOOL UNION CLOTH

Naphtamine Union Blue C on 100 lbs. cotton and worsted union cloth. Prepare the dye bath with

5 lbs. Naphtamine Union Blue C. (Kalle & Co., 530 Canal St., N. Y.)
20 lbs. Common Salt.

Enter the material at 80° F., and bring to a boil in 1/2 hour, boil for 1/4 hour, shut off the steam and run for 1/2 hour in the gradually cooling dye bath.

Naphtamine Union Blue C, especially in conjunction with Naphtamine Union Violet C, is valuable in the production of the Coronation shades of blue and purple which are so much in demand at the present time.

Recipe No. 24

BLACK ON WORSTED YARN

Guinea Black 3 B X Extra on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Guinea Black 3 B X Extra. (Berlin Aniline Works, 213 Water St., N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 120° F., and dye at a boil for one hour.

Guinea Black 3 B X Extra leaves effect threads unstained with cotton, ramie and artificial silk. Silk, however, is strongly stained.

Its fastness in general is good.

Recipe No. 25

ORANGE ON WORSTED YARN

Anthracene Orange G on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Anthracene Orange G. (Cassella Color Co., 182 Front St., N. Y.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter material at 45° C., raise to a boil and after boiling for 20 minutes, exhaust the bath by gradually adding

2 lbs. Sulphuric Acid,

then boil 3/4 of an hour in a bath made up with

1 lb. Potassium Bichromate.

Anthracene Orange G possesses excellent fastness to light, washing, milling, alkalies, and steaming.

Recipe No. 26

BLUE ON COTTON YARN

Sulphur Blue 4 R Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Sulphur Blue 4 R Extra. (Berlin Aniline Works, 213 Water St., N. Y.)
20 lbs. Sodium Sulphide.
5 lbs. Soda Ash.

First add the soda ash to the bath, then the

dyestuff which has been previously dissolved in conjunction with the sodium sulphide. The bath is then thoroughly stirred and the dyeing carried out at a temperature just below the boil, keeping the material below the surface of the liquor as much as possible. After dyeing the goods are rinsed immediately, without the customary hanging in air.

Sulphur Blue 4 R Extra possesses good fastness to light, weather and washing.

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Recipe No. 27

VIOLET ON WORSTED YARN

Oxy Chrome Violet B O on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Oxy Chrome Violet B O.
(Geisenheimer & Co., 189 Front St., N. Y.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt

Enter at 120° F., and dye at a boil for 1/2 hour. Then exhaust the bath by adding

2 lbs. Sulphuric Acid.

When exhausted, after-chrome in a bath for 3/4 of an hour, made up with

2 lbs. Potassium Bichromate.

Oxy Chrome Violet B O possesses the characteristic fastness of the after-chromed colors.

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Recipe No. 28

BLUE ON WORSTED YARN

Lanacyl Blue B N on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Lanacyl Blue B N.
(Cassella Color Co., 182 Front St., N. Y.)
20 lbs. Glauber's Salt.
10 lbs. Acetic Acid.

Enter at 120° F., bring to a boil and dye at a boil for one hour.

Lanacyl Blue B N possesses excellent fastness to light, alkalies, and carbonizing.

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Recipe No. 29

BROWN ON WORSTED PIECE GOODS WITH SILK EFFECT THREADS

Naphthalizarine Brown R D D on 100 lbs. worsted piece goods with silk effect thread. Prepare the dye bath with

4 lbs. Naphthalizarine Brown R D D.
(C. Bischoff & Co., 451 Washington St., N. Y.)
1½ lbs. Bichromate of Potash.
8 lbs. Acetate of Ammonia.

Enter the material at 140° F., raise to a boil and dye at a boil for one hour, exhausting with

8 lbs. Acetic Acid,

added in small portions.

Naphthalizarine Brown R D D will be found an excellent dyestuff for the dyeing of worsted and woolen piece goods containing silk effect threads, as it leaves the silk entirely white.

Recipe No. 30

RED ON WORSTED PIECE GOODS

Alizarine Red 6 B S on 100 lbs. worsted piece goods with silk stripes. Prepare the dye bath with

2½ lbs. Alizarine Red 6 B S.
American Dyewood Co., 84 William St., N. Y.)
3 lbs. Ammonia 26° Tw.

Enter goods lukewarm and bring quickly to a boil. Add

6 lbs. Acetic Acid,

and boil 40 minutes; add

1½ lbs. Sulphuric Acid,

and boil another 1/2 hour; add half as much Chrome as color and continue the boil a further 1/2 hour; rinse.

Alizarine Red 6 B S is a level dyeing color especially adapted for coloring worsted piece goods containing silk stripes, leaving the silk unstained. It is also recommended for its fastness to light.

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Recipe No. 31

GREEN ON COTTON YARN

Diazo Fast Green B L on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diazo Fast Green B L.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
30 lbs. Common Salt.
½ lb. Soda Ash.

Dye at a boil for one hour. Then diazotize in a cold bath made up with

2 lbs. Sodium Nitrite.
7 lbs. Hydrochloric Acid, Conc.

Work in this cold bath 15 minutes, rinse and develop in a bath made up with

1 lb. Developer A.

Diazo Fast Green B L gives a comparatively bright shade of green, possessing very good fastness to light, washing and alkali.

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Recipe No. 32

BLACK ON WORSTED YARN

Acid Chrome Black H R on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Acid Chrome Black H R.
(Badische Company, 86 Federal St., Boston, Mass.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 120° F., and dye at a boil for 1/2 hour. Then add

2 lbs. Sulphuric Acid,

and continue the dyeing at a boil until the bath is practically exhausted. Finally add

2 lbs. Potassium Bichromate,

and boil for 3/4 of an hour longer.

Acid Chrome Black H R possesses excellent fastness to light and washing.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Cloth Shrinking Machine. The Reliance Machine Works, Frankford, Philadelphia, Pa., are placing on the market a cloth shrinking machine which operates by the hanging method. A description appears in this issue.

Drawing Frame. The Saco-Pettee Co., Newton Upper Falls, Mass., have adopted a number of important improvements in their drawing frame, a description of which appears in this issue.

Yarn Moistening Machine. Rudolf Scholz, Zittau, Saxony. A machine for automatically moistening yarn on cops or bobbins.

Builder Motion. A. W. Schuette, Krefeld, Germany. An improved builder motion for spinning machines.

Silk Weighting. Carl E. Sachse, Elberfeld, Germany. A process for reclaiming sodium phosphate from the waste liquor used for weighting silk.

Oiling Wool Sliver. Jacob Eichhorn, Landau, Germany. A device for applying oil to the sliver during the manufacture of worsted yarn.

Fringe Machine. Schubert & Salzer, Chemnitz, Germany. An improved machine for tying fringe.

Yarn and Cloth Scouring Machine. Gebrueder Schmid, Basel, Switzerland. An automatic machine for scouring yarn and cloth. The material is first treated with soap foam and afterwards rinsed without being subjected to a squeezing process.

Warp Printing Machine. Otto Hallensleben, Hanau a. Main, Germany. A machine for printing warp yarn by means of stamps operated by a jacquard motion. It is claimed to offer important improvements over the ordinary process.

Roving Machine. Arno Unger, Crimmitschau, Germany. An indicator for recording the number of sets of roving delivered from each frame.

Shuttle Guide. Victor Weinhausen, Aachen, Germany. A device attached to the loom lay and having for its object to guide the shuttle back to its proper course in case it is deflected by any means.

Self Feed. Ernst Nolte, Wiesbaden, Germany. An improved self feed for first breaker cards for which a number of improvements are claimed.

Spooling Machine. Wuppertaler Textil-Maschinenfabrik, Elberfeld, Germany. A self-acting spooler especially adapted for winding yarn for ribbon and braiding machines.

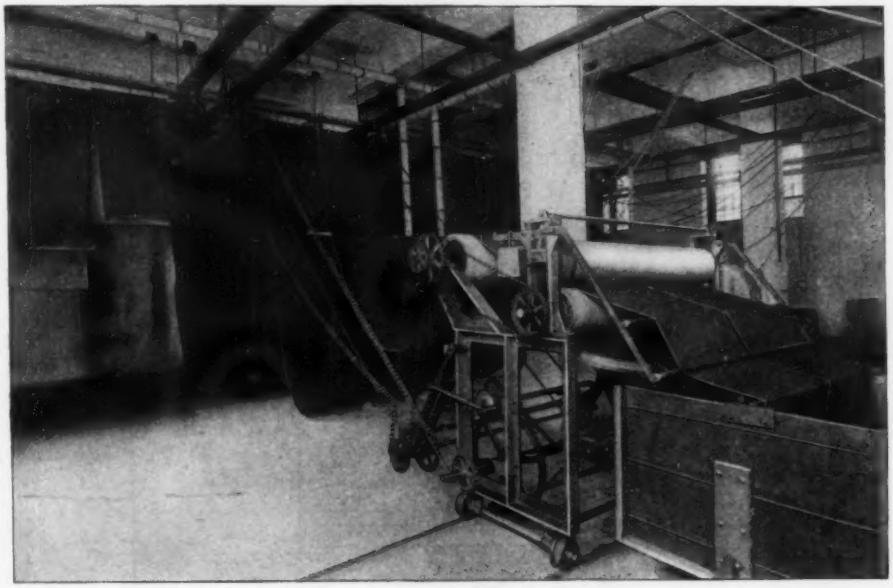
Winding Machine. Ferdinand Rosskothen, Dresden, Germany. A machine for cross-winding yarn in cheeses.

Band Tension. Ignaz Etrich, Oberaltstadt, Bohemia. A tension device for spindle bands.

Automatic Loom. J. C. Diederichs, Bourgoin, France. A device for automatically feeding filling bobbins to an automatic loom.

THE RELIANCE CLOTH SHRINKING MACHINE

The illustration shows the Reliance cloth shrinking machine built by the Reliance Machine Works, Frankford, Philadelphia, Pa. This machine, which treats the goods by the hanging process, is adapted for shrinking both wool and cotton goods. It is made in any width desired to suit the goods to be handled. The cloth is carried over a large wooden drum to the racks, as shown in the illustration. The sticks separating the cloth are fed mechanically and timed to correspond with the required length of the fold. The spacing on the rack is adjusted mechanically, the sticks being set four inches apart, thus affording sufficient air space to facilitate the shrinking process. The goods can be taken from the rack at either the front or back of the machine by an automatic plating-down device by which all stretching is avoided. The plating-down device is attached to the ceiling and, therefore, occupies no floor space. This machine is automatic throughout, delivering 40 yards per minute and can be controlled either from a shafting or by direct connected motor. The machine occupies a floor space of 8 by 10 feet when the racks are empty.



THE RELIANCE CLOTH SHRINKING MACHINE

THE LORD WATER SOFTENER AND PURIFYING SYSTEM

The accompanying line drawings show the front and side views of the Lord Model "A" Automatic Water Softener or Purifier, recently brought out by George W. Lord Company, Philadelphia.

The water enters through the inlet pipe and passes over a water wheel, which furnishes the power for the operation of the filter. The shaft supporting this wheel is connected by a chain drive with a horizontal shaft above the two mixing tanks, which in turn are connected by miter gears with two vertical shafts, equipped with paddles for agitating the water in the mixing tanks, thus aiding the precipitation of the injurious solids. This water wheel also drives paddles in a chemical storage tank, which continually agitates the solution of chemicals so as to keep the same of a uniform consistency and strength at all times. These purifiers are also equipped with chemical measuring valves to regulate the amount of chemicals

used from time to time, which are operated by a dumping bucket. The bucket also operates a series of lower valves, by opening and closing these valves at proper intervals, thus giving a complete automatic action.

After the water leaves the water wheel it enters the upper line of pipe and flows first to the right and then to the left. The flow is regulated by the lever valves referred to above, which are connected with the inflow and the outflow pipes. For example, the water first passes through the pipe leading into the right hand mixing tank, until this tank is completely filled. After this, a sufficient amount of water overflows through a pipe in the upper part of the tank into the dumping bucket, which tilts and closes one upper valve and opens the lower valve directly underneath, thus allowing the water to flow from the mixing tank and enters the main filter tank of the purifier. This action is then repeated in the left hand tank and runs indefinitely until the storage tank is filled. After the agitation is completed, the water next flows through a center partition or cylinder into the main filter tank, which separates the raw water from the treated water, and after this flows upward through the filters and overflows into the storage tank at the side or directly into the boilers. The precipitates, in the meantime, settle into the funnel shaped base of the filter tank. Some of the precipitates may be carried up a slight distance, but being of a heavy nature the tendency is to settle, and on the down-

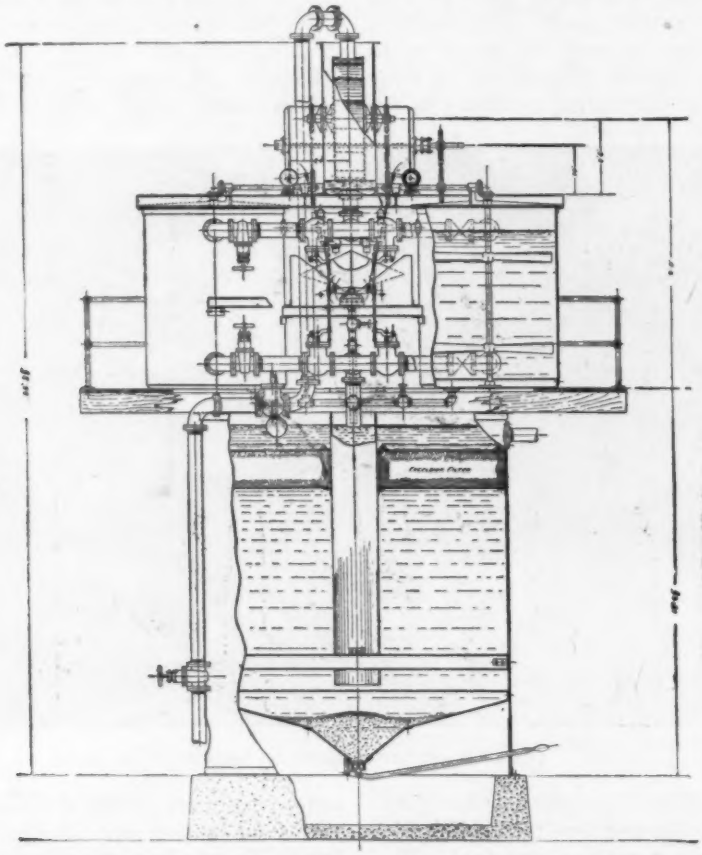


FIG. 1. FRONT VIEW OF THE LORD AUTOMATIC SOFTENER OR PURIFIER

ward flow they naturally come in contact with other particles rising and unite with them, causing same to fall to the base of the purifier, where they are removed through a sludge valve intended to convey the sludge or impurities into the sewer. The filters remove any remaining trace of precipitates, the result being a perfectly pure water suitable for all manufacturing or industrial purposes.

Figure 3 shows the chemical measuring valve, which holds a definite amount of reagents furnished for precipitating the injurious solids. This valve is equipped with an inner measuring cup and brass sleeve on the outside cover, which this cup slides back and forth. The cup itself has an opening at the bottom, and a small opening or air vent at the top, which allows the air to pass in and out at proper intervals. The valve is operated by a dumping bucket, as it tilts back and forth, which causes the opening in the inner cup to rotate back and forth, so as to come directly in contact with the two ports on the right and left, one of which is connected with the chemical storage tank and the other with the mixing tank. This allows the measuring valve to be filled and emptied at regular intervals, making the action an entirely automatic one. In this way a definite amount of chemical solution is fed into the mixing tank at regular intervals, the

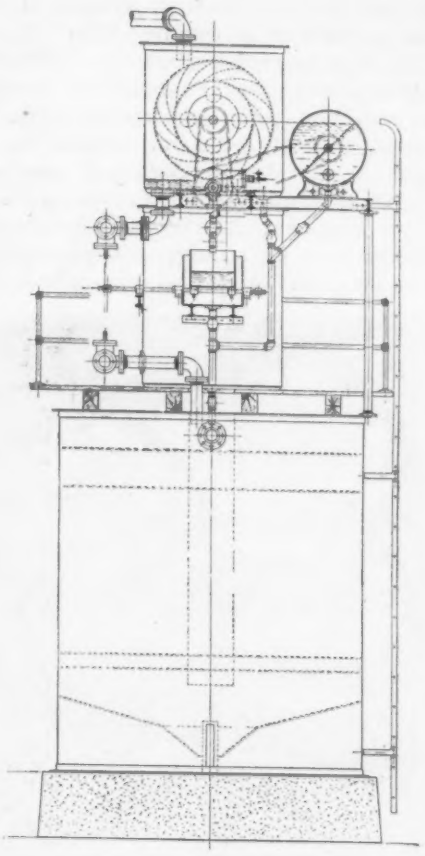


FIG. 2. SIDE VIEW.

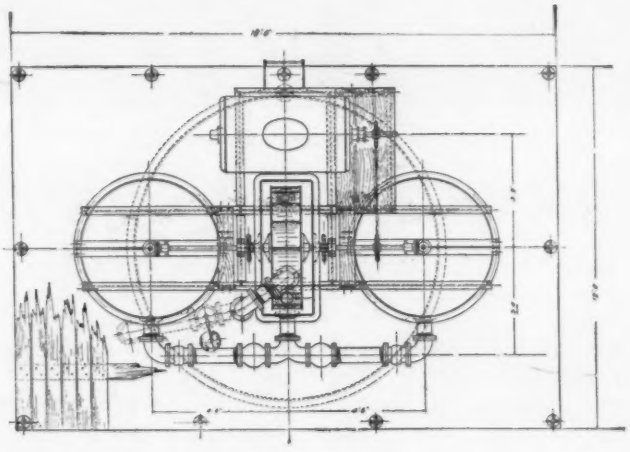


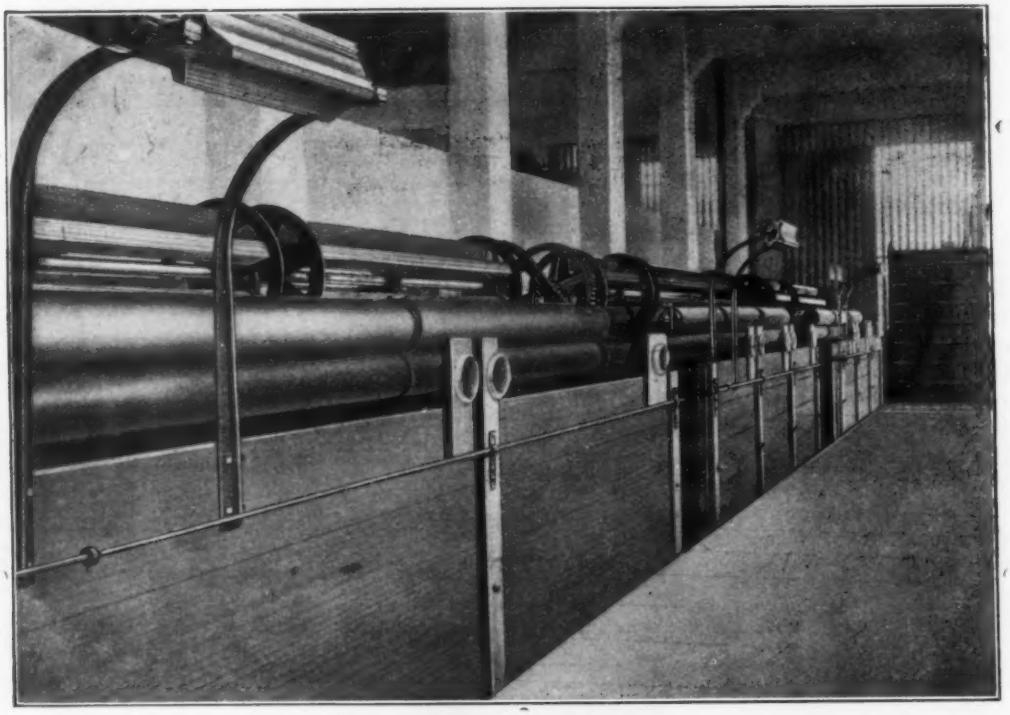
FIG 3. PLAN.

amount being so regulated as to be of sufficient strength to precipitate all the injurious solids in a tank of a given size. The float valve connected on the inlet pipe is operated in connection with the storage tank, and controls the entire system, inasmuch as the water in this storage tank as it gradually fills will close the valve, and thus cut off the supply of water. As the water subsides or is drawn from the storage tank from time to time, the float valve will naturally fall or open, thus allowing the water to pass through the lines and the operation of the plant to continue.

The Lord Water Softener was designed for the cold water treatment of feed waters, in industrial plants where a large battery of boilers is required, or where a water highly concentrated with injurious solids is being used. Another very important feature was not overlooked, that of keeping the installation cost low. The business of the George W. Lord Company is primarily a chemical business, which enables them to analyze and accurately prescribe for the treatment of boiler feed waters to insure the best results. A sample gallon of water may be sent for chemical analysis without expense.

A CONTINUOUS BLEACHING PROCESS

The illustration shows the continuous bleaching machine built by the Utica Novelty & Mill Specialty Co., Utica, N. Y. The cloth is first boiled off in the kier and unloaded by a power conveying same to the first box of the bleaching machine. The squeeze rollers and reel carry the goods in spiral form through the different compartments, finally delivering it from the last compartment to trucks. The advantages of this system include a uniform bleaching, a saving of liquor, and economy in time and labor. Machines of this type are in operation, some of which are handling 20,000 pounds of goods per day. The builders will also provide an improved boiling-off kier if desired. In addition to this bleaching system the Utica Novelty & Mill Specialty Co. build a number of valuable appliances for textile

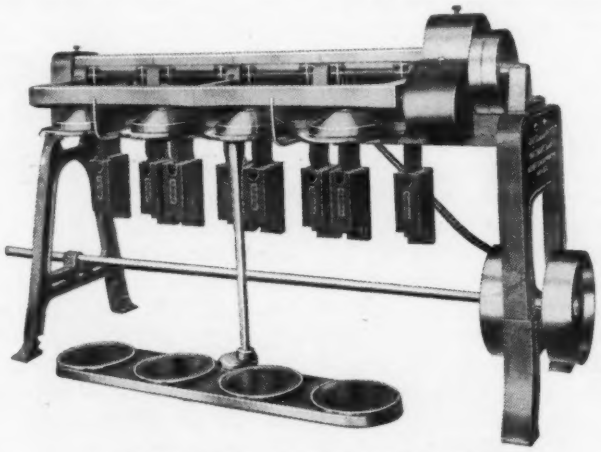


A CONTINUOUS BLEACHING MACHINE.

mills, including a string conveying system, rotary fulling mills, tom-toms, string dyeing and washing machines, turning machines, collarette cutting and winding machines, electric heated neck markers, cloth cutting machines, extractor guards, and the Johnston vertical dryer.

THE SACO-PETTEE IMPROVED DRAWING FRAME

Simplicity and durability are the features of the improved drawing frame built by the Saco-Pettee Co., Newton Upper Falls, Mass., and shown in the illustration. Long and costly experiments, both in the machine shop and in mills using all grades of cotton, have been made during the past few years to determine the details of construction on a frame that will turn out the largest production with the least waste, is nearly proof against the careless handling of unskilled operatives common in preparatory departments, that is convenient and direct in operation, and durable as regards wear. The result is that improvements have been made in practically every part of the frame.



THE SACO-PETTEE IMPROVED DRAWING FRAME

The object of the drawing frame is to double a number of slivers from the cards, varying in weight per yard, and draw them into one even sliver with the fibers laid as nearly parallel as possible. It is necessary to handle the comparatively uneven slivers from the card cans as delicately yet as positively or firmly as possible, avoiding undue tension between the card can and the back drawing roll, and to draw these slivers evenly through the fluted rolls, delivering a single sliver without kinks or bunches through calendar rolls, and coil it uniformly in cans ready to be used in the next process.

To perform the work evenly, stop motions must be provided to stop the head in case a sliver ceases from any cause to go through the operation in the required way. A great improvement over the old stop motion has been effected by providing patent stamped steel spoons pivoted on the edge of a case hardened steel knife bar which is located and held in line by a groove milled in the back plate. The advantages of the new spoon are that it is exceedingly strong, yet light. The mouth can be readily closed or opened, or the entire spoon can be bent for balance to suit any weight of sliver that may be required. The new knife bar presents a fine edge on which the spoons are pivoted without danger of cutting in, a fault which resulted with the cast-iron bar used on older frames.

Every overseer of drawing has experienced the annoyance attendant on the stripping of gears and rolls when this is necessary from any cause. Ordinarliy this entails the removal of several gear stands and roll bearings, which are replaced only after the expenditure of considerable time. Frequently an accurate adjustment is lost. The builders have designed and patented a one-

piece head end gear stand which permits of the removal of all gears and rolls without disturbing the stand. As a result the ease and speed with which rolls and gears are changed or replaced insures a great saving of time, and perfect alignment and accurate settings are secured. The rigidity of the stand also adds to the durability of the gearing.

By a new method of attaching the end support the same beam may be used for either end or intermediate heads, and frames may be extended or rearranged in the mill with the least possible trouble, each head being self contained. All roll stands are machine finished in every part and are perfectly interchangeable. A novel method is used to reinforce the bearings with brass by which it is practically impossible for the bushing to become loose. Another valuable feature is a stationary bushing which forms the bearing for the front roller and loose pulley. This is self oiling.

The several sections of the back or long calender rolls have usually been made of cast iron and keyed on a continuous shaft, the gears at the inner sections in five or six-delivery heads being pinned on in two parts or halves. These split gears give a great deal of trouble when used where a roll runs two hundred revolutions a minute by breaking apart or working loose, causing stoppage, with loss of production, and much expense for repairs. On this frame a patent calender roll is used which is made from one solid piece of cold rolled steel necked down to form bearings. Gear teeth are cut into the solid steel and with any number of deliveries per head the use of a split gear is unnecessary. Severe tests have proved this arrangement to be practically indestructible.

The front calender roll also is made from one piece of cold rolled steel and being larger in diameter than the bottom roll enables the trumpet to be set at an obtuse angle relative to the line of the sliver passing from the front drawing roll to the calender rolls. This removes a frequent trouble and much waste caused by the sliver breaking as a result of passing into the trumpet at an acute angle. The distance of the trumpet from the calender rolls is adjustable to provide for the handling of long or short staple cotton.

To assist the calender rolls in condensing the sliver the calender roll cover is made heavy enough to give the pressure needed without the use of springs or other common but cumbersome devices. This cover rests on the bearings of the top calender roll, giving the needed pressure, preventing roller laps, forming a neat cover for the rolls and protecting them from injury at the same time. It is readily thrown up, without the use of wrench or other tool, when necessary to expose the calender rolls.

Especial care has been devoted to prevent fly from getting into the tube gears. The coiler cover has milled joints which prevents trouble from this source. Another improvement over the usual cover is the provision for removing the front half without disturbing the tube gear, this section simply resting in a turned groove in the coiler plate from which it may be readily removed. The simplicity and convenience of this arrangement for releasing both cover and gear in case of necessity will be appreciated by practical mill men. It also tends to increase production.

There are numerous other improvements, including interchangeable parts, specially constructed turn-tables, patent top clearers, back plate and improved sliver guide, and full can stop motion. The improved drawing frame is made in heads of four, five and six deliveries which can be made into frames of any desired length to suit the arrangement of the mill. Either metallic or leather-covered top rolls are used.

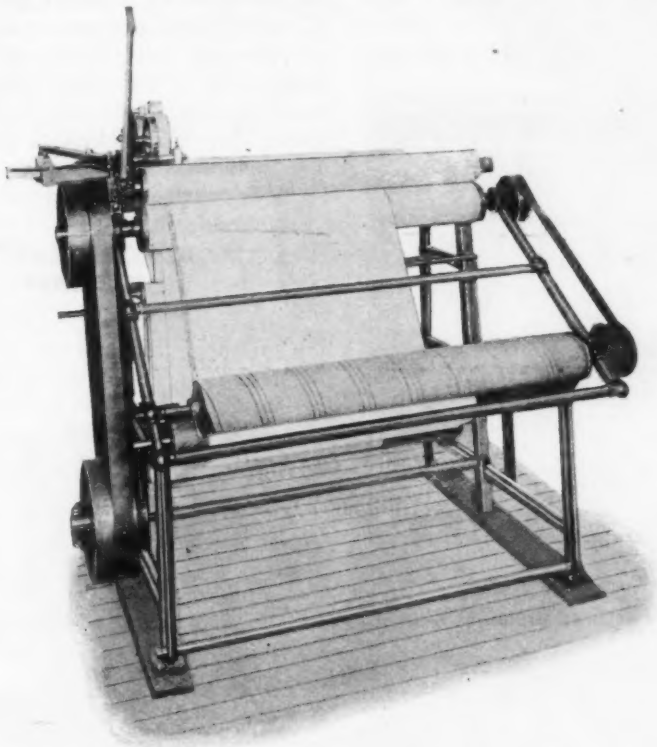
Saco-Pettee Company, Newton Upper Falls, Mass., the inventors and builders, have prepared a special booklet illustrating some of the new features and containing information on rolls, drafts and production.

The cultivation of ramie was first introduced into the United States in 1855. Experiments made since that time show that it may be successfully grown in the Southern states and in California.

THE BAIRD SELVAGE TRADE-MARKING MACHINE

The importance of marking textiles so that the consumer may know the name of the manufacturer or trade-mark is becoming more apparent as time passes. Without some identifying mark of this kind advertising in a great measure fails of its purpose. The consumer frequently has no means of obtaining the goods except from the particular firm from whom he obtained the previous lot and the selling agent and not the manufacturer reaps the advertising benefits of a good product.

Certain difficulties are apparent in marking textiles and it was to remedy such difficulties and provide manfacturers with an effective means of marking their goods at a low cost that the Robert Baird machine, shown in the accompanying illustrations, was designed. This machine is built by Robert Baird, 66 Leonard St., New York. The marks made by the machine bear a strong resemblance to the effect produced by fine jacquard weaving. The goods can be marked in a straight line close to the selvage at intervals of a yard or less regardless of how irregularly the cloth may be presented to the machine. Every letter shows clearly and distinctly, without blur or blemish from one end to the other of a roll of goods, whether 300 or 3,000 yards long. Weft cords, etc., running through the selvage often make ordinary printing almost impossible, but they offer no obstacles to the new machine, which will give clear lettering in exactly the right place, at a speed of from 100 to 120 yards a minute. The illustration shows printing on a heavy worsted fabric, on a fine light worsted, on a shirting flannel, and also on a variety of cotton goods, including a well known tissue and a popular gingham.



THE BAIRD SELVAGE TRADE-MARKING MACHINE

After the cloth has passed through the

various finishing processes and is ready for folding it is placed in front of the machine. It is generally wound on a roll or shell, the end is threaded through tension bars, then passed over the bed roll of the machine, under another roll, through a pair of grip rolls, then around another shell or roll similar to the one from which it is taken. A batching roll is attached to movable arms and connected by a belt with a grip roll which is then lowered into position on top of the shell or roll. The machine is driven from the grip

SAMPLES OF WORK DONE BY THE ROBERT BAIRD SELVAGE PRINTING MACHINE

roll. The revolving of the bed roll sets the printing mechanism in motion. The latter is attached to the bed roll, which is arranged to slide to the right and left by the touch of the operator's hand upon a lever placed within easy reach for that purpose. As the bed roll in revolving constantly offers a new portion of its surface, it is as easy to make the printing head follow accurately any desired line of the selvage as it is to follow the tempo line on a perforated music roll and without dragging the cloth in the least. In this way, no matter how irregularly the selvages may be, the printing follows every curve, and remains parallel with the edge of the cloth all the way through.

The printing is accomplished by a mechanism which causes the necessary quantity of ink to pass through very small perforations in a fine steel plate, depositing it upon the cloth with unvarying accuracy. This makes it possible to use a very heavy opaque ink specially prepared for the process. The aluminum, white or light colors stand out just as clearly on black or dark colored goods as dark ink will on white. It is claimed that the colors will not rub off and they are not affected by boiling water, soap, acids or washing compounds. The marks may be changed in three or four minutes. The color of the ink may be changed in two minutes as there is no cleaning up to be done when a change is made.

A NEW DEVELOPMENT IN STEAM-TURBINES

A new type of combined impulse and reaction turbine, christened the "Spiro" has been put in the market. Patents are pending in the United States, Canada and foreign countries.

As it is of small size and in horse power ranges from the smallest up to several hundred, it fills a gap which has long been aimed for. The principle of its design and operation will be seen at a glance from the illustration showing the runners with herringbone teeth at Fig. 1. The steam impinges in the central pocket formed by the juncture of the teeth.

This turbine is the invention of John H. Van Deventer, superintendent of the Buffalo Forge Co., Buffalo, N. Y. Those closely connected with this company have for several years been anticipating the successful termination of the experiments and tests, which have been known to be conducted at their plant with a view to crystallizing into a practical, matter-of-fact machine the ideas which formed the nucleus of the invention.

Three years of development and perfection already lie behind it. The salient points about its strength, durability and economy are therefore matters that have been determined by experience.

The construction of the turbine is extremely simple. It consists essentially of

five parts, the case, two heads with bearings, and two rotors. These rotors consist simply of helical gears, cut by special machinery, without any loose or inserted blades. The steam action within the pockets formed by these spiral gear teeth is theoretically perfect, making full use of the impact of the fluid due to its velocity, and avoiding the leakage frequently found in turbines, which impairs their mechanical efficiency.

The first impression of the "Spiro" is its extremely small size for a given power. The photograph showing the 186 h. p. turbine illustrates this forcibly. This particular outfit has been in use for the last three years as a motive power in driving fans, gas scrubbers and other apparatus requiring a running test. We are informed that it has not been apart, or had a single adjustment made upon it since its installation. The stated power of this outfit, namely 186 h. p., was developed under 100 lbs. initial pressure. It has been decided to base the rating of all "Spiro" turbines on this pressure, although the common practice is

illustrations shows a 10 h. p. "Spiro" direct connected to a 25-inch fan, which is at present furnishing forced draft, through Jones Underfeed Stokers, to 300-boiler h. p., under extremely severe conditions. The highest

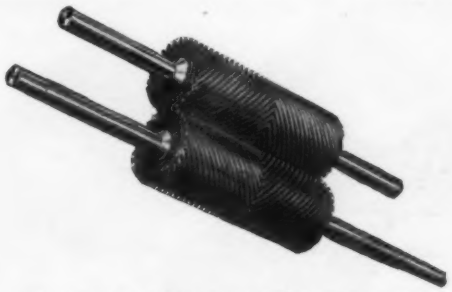
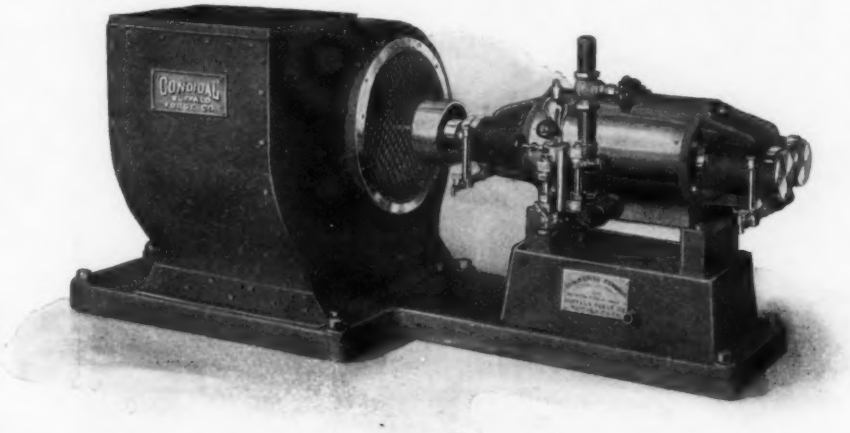


FIG. THE SPIRO RUNNERS MOUNTED ON SHAFT

pressure carried on the boilers is only 90 lbs. The small size of this outfit is unique.

There are but two points of wear in the "Spiro" turbine, namely the bearings and the tooth contact. In the bearings, the lubricating system is so designed that each bearing acts as an individual oil pump, circulating oil



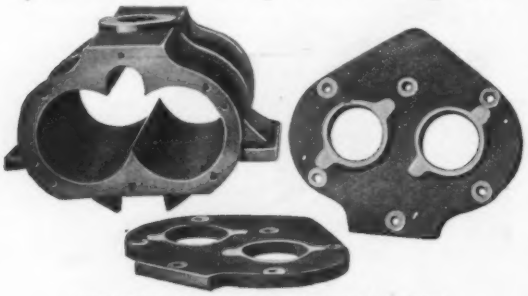
A 25-INCH "CONOIDAL" FAN DRIVEN BY A 10 H. P. SPIRO TURBINE

150 lbs. initial pressure as a basis, but it is believed that 100 lbs. comes closer to the initial pressure under which small sized turbines are generally required to run.

The "Spiro" is at present manufactured in sizes from 1 to 50 h. p., non-condensing; and patterns are being rapidly completed for an extension of sizes up to 300 h. p. One of the

through the bearing between shaft and bushing, with a positive pressure. This forms a perfect oil film, and as long as there is any oil in the reservoirs or oil chambers which form part of each bearing, this oil film is automatically maintained. Thus there is no metal to metal contact in the bearings, all the contact coming upon the oil film.

The tooth contact must be said to be very satisfactory. The helical gears are particularly efficient for high speed service, smoothly running and of strength far beyond the requirements. The length of the spiral rotors in the "Spiro" is much greater



CYLINDER AND HEADS FOR SPIRO TURBINE

than would be necessary for the face of spiral gears transmitting equal loads at equal speeds, and as a result the maximum tooth pressure per square inch is limited to 5 lbs. It has also been discovered that a film or cushion of steam is at all times maintained between the teeth of the rotors, which causes an elastic contact sufficient to produce great smoothness of action.

Tests made upon the "Spiro" turbine are reported as follows:

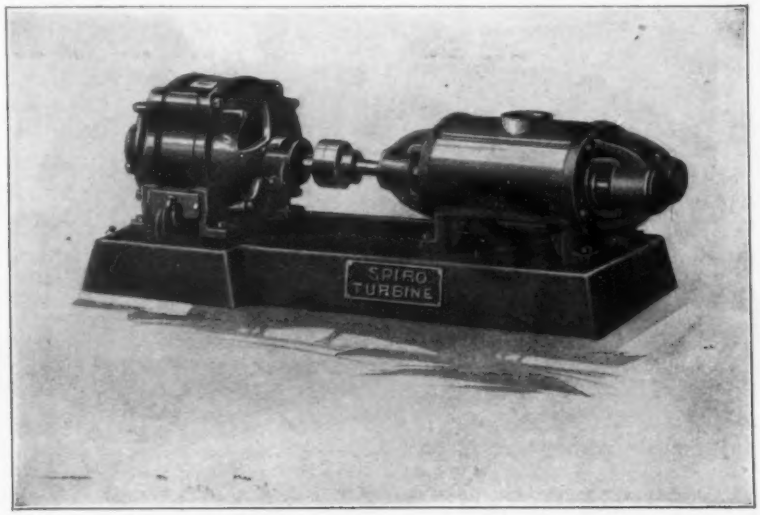
No. 1

Boiler pressure	lbs. 120
Initial pressure	lbs. 101.5
Horse power	25.3
Speed	2,450
Water per b. h. p. (non-condensing)	= 53.2

No. 2

Boiler pressure	lbs. 130
Initial pressure	lbs. 115
Horse power	lbs. 151
Speed	2,710
Water per b. h. p. (non-condensing)	= 31.8

A striking example of the great power developed in a small space is furnished by a line of air drills embodying the "Spiro" turbine, which the Buffalo Forge Company has been developing, and which will shortly be put on the market. A one-quarter inch drill will penetrate hard cast iron one inch thick in twelve seconds, or at the rate of five inches per minute. The rotors employed in this drill are the ones shown in the illustration,



A SPIRO TURBINE DIRECT CONNECTED TO GENERATOR.

which may be grasped within the palm of a hand, and to drill iron at this rate requires over three-quarters of a horse power. Hundreds of visitors have seen these drills at the shops of the Buffalo Forge Company, and have expressed surprise at the fact that so

much evidence of power can be produced from such small rotors.

A CONVENIENT MEANS FOR DETERMINING FLUE GAS TEMPERATURES

One of the notable developments in modern steam plant practice is the introduction of meters for weighing the coal, measuring the boiler feed water, determining the flow of steam, sampling the gases of combustion, recording the temperature of the water entering the boiler, measuring and recording the draft in the ashpit and in the chimney and measuring the many other quantities that enable a steam plant engineer to compare his plant intelligently with other plants of the same class and to determine the magnitude of losses and the possibilities of improvement.

TEMPERATURE PENDANTS

In the operation of a steam boiler, one of the most important quantities is the temperature of the gases passing to the chimney, since, other things being equivalent, temperature is a direct measure of the portion of the heat of the fuel which is wasted or not utilized. If we assume a pound of coal having a heating value of 14,000 b. t. u. to be burned with 20 pounds of air, which is about the smallest ratio of air to coal found in actual commercial practice, the temperature in the furnace after complete combustion should be about 2500° F. above the temperature of the atmosphere. The temperature of steam at 150 pounds gauge pressure is 366° F. and if it were possible to transfer all of the heat in the gases above this temperature (and it is impossible to transfer any below this temperature) to the steam and water in the boiler, the efficiency of the boiler would be 88 per cent.; that is, the boiler would recover all but 12 per cent. of the heat of the coal.

As a matter of fact, no boiler reduces the temperature of the gases to the temperature of the steam. To do so would require an impracticable area of heating surface, since, as the temperature of the gases approaches that of the contents of the boiler, the rate of heat transmission per square feet of boiler surface per hour falls lower and lower, being proportional to the difference in temperature between the gases and the water in the boiler. There is, therefore, a limit to the amount of boiler surface that it pays to put in. Beyond a certain point the interest and charges on extra boiler surface amount to more than the value of the heat regained. Commercial practice some years ago established this limit of surface at about 10 square feet of boiler surface per boiler horse power, but recent practice has shown that a boiler horse power can be produced from much less surface, as 3 to 5 square feet or even less, and in some plants it has become a matter of routine to drive the boilers at about 60 per cent. above the nominal rating of 10 square feet per boiler h. p.

Even disregarding the number of square feet of boiler heating surface employed to produce a boiler horse power, it is found in commercial plants that the chimney gases escape at temperatures considerably above the steam temperature, as at 450° to 500° at least, which represents a waste of from 20 to 40 per cent. of the heat of the coal, depending partly upon the amount of air used to burn a pound of coal. In a 1,000 h. p. plant running 24 hours per day, 360 days per year, with a load factor of 50 per cent., and burning coal costing $2.50 per ton, a 25 per cent.

waste of coal amounts to $6,000 per year, not including charges for handling coal and ashes, therefore some little time and study to determine the extent of the waste in any given case is well justified.

The usual and most practicable way of recovering waste heat from chimney flue gases is by means of the economizer, the heating surface of which, because of the lower temperature of the contents, is much more active in absorbing heat than an equal amount of surface in the last pass of the boiler. That is, since the economizer receives water at a temperature of 80° to 150° and discharges the water at 200° to 300°, with an average temperature for the whole economizer of around 200° to 220° F., say, it is able to absorb about twice as much heat from 500° F. gases as can the boiler surface.

Obviously the advisability of putting in economizers or of making other changes in the equipment depends to a large extent upon the actual temperature of the gases as they leave the boilers. In some cases this temperature is much higher than in other cases where approximately the same amount of coal is being burned on grates of the same type and the boilers are driven at the same rating. In such cases it usually turns out that the low temperature is also accompanied by a large excess of air and the efficiency of the boilers delivering low temperature gases is more often than not, lower than that of boilers delivering high temperature gases. The temperature of the flue gases is therefore an essential factor in checking the proper operation of the furnaces, the tightness of the setting and other factors, as well as for calculating the heat available for recovery.

Indicating and recording thermometers and pyrometers are sometimes put in for measuring the temperature of flue gases, but their use is not general, due partly to their cost and also to the fact that many types of instruments are not reliable or break down in service. There is therefore a demand for cheap and efficient means of determining flue gases, temperatures which the Green Fuel Economizer Company, of Matteawan, N. Y., has met by devising the temperature pendants shown herewith. These pendants consist, as may be surmised, of fusible alloys of the proper composition to indicate the desired temperatures.

It is an interesting fact that the melting points of such metals were found to be too uncertain and evasive to be used as temperature tests. That is, it is difficult to tell the exact point at which the metal melts, since it does not change suddenly from a hard solid to a liquid, as does water, iron and many other substances. Even after the metal is completely melted, a hard skin of oxide is usually found to have been formed upon its surface, which prevents the metal running easily and therefore is apt to confuse the determination of the exact temperature.

The Green Fuel Economizer Co., therefore, devised the expedient of using the tensile strength of the metal, instead of the melting point, as the true indication of temperature. In other words, the pendants are made with a large body, having a certain definite weight, suspended from a narrow neck, and the composition of the metal and cross section of this neck are adjusted until the body of the pendant will pull the neck in two and fall at some desired temperature.

In actual use the pendants are hung upon a small hook made upon the end of a long wire, which is introduced into the flue so that the pendant will be at the desired point. The best way is to begin with the lowest temperature pendant and proceed until the one is found which will not fall off after 5 or 10 minutes' exposure. The temperature will then lie somewhere between the temperature marked on the last pendant and the next to the last pendant used. In doing this, it is quite essential that several different points in the flue be tried, as it very frequently happens that one part of the flue is occupied by gases much hotter than the gases in other parts of the flue.

At present the Green Fuel Economizer has perfected pendants for three temperatures, i. e., 425°, 500° and 550° F., representing respectively the temperature at which the use of the economizer is justified with coal at commercial prices, the temperature at which an economizer is a good investment in all cases, and the temperature at which neglect to install an economizer becomes an inexcusable waste.

Personals

John S. White, New England agent for the Morse Chain Co., of Ithaca, N. Y., is rapidly recovering from the effects of an operation for appendicitis, which he recently had to undergo. Mr. White's friends will be glad to learn that the operation was entirely successful.

Albert W. Thompson has been appointed superintendent of the Lowell Machine Shop, Lowell, Mass., commencing the first of February. Albert T. Morton, who has been filling that position, will hereafter be free to devote his entire attention to the machine designing and development work. Mr. Thompson is widely known through his association with the Amoskeag Mfg. Co., of Manchester, as mechanical superintendent and engineer. He is the inventor of the Turbo-Humidifier, the Amoskeag Yarn Conditioner and other improvements in relation to textile machinery. He is no stranger to the management of large machine shops, as the Amoskeag shop is a large and well equipped establishment, capable of handling not only all the mill repair work but of building machinery. Mr. Thompson's connection with this leading cotton machinery company is a matter of mutual congratulation to all concerned.

Charles H. Plummer, agent of the Great Falls Mfg. Co., Somersworth, N. H., and who has held the position for the past twenty-six years, has severed his connection with that company.

Abraham Whitaker, for several years superintendent of the Lorraine Mfg. Co., worsted department, has resigned to accept the position of agent and superintendent of the Limerick Mills, Limerick, Me.

F. W. Freeman, for the past five years treasurer and general manager of the Aetna Mill, Watertown, Mass., has severed his connection with that company.

John Simpson, late superintendent of the Globe Woolen Co., Utica, N. Y., has been appointed general manager of the Aetna Mill, Watertown, Mass.

Wm. F. Ray, manager of the Ray Fabric Co., Franklin, Mass., has severed his connection with that company. His successor is A. R. Ray, now president of the company.

Philip H. Stiles, formerly superintendent of the Great Falls Mfg. Co., Somersworth, N. H., has been appointed agent. He has been in the employ of this company since 1878. He was overseer of carding at this mill, later appointed superintendent and by the faithful discharge of his duties he was advanced to the position of agent.

Thomas Thomas has been appointed superintendent of the Orr Felt & Blanket Co., Piqua, O.

Frank J. Whithan has accepted the position as overseer of weaving at the Androscoggin Mill, Lewiston, Me. He formerly held a similar position at the Stark Mill, Manchester, N. H.

Milton H. Silver, overseer of carding at the Bigelow Carpet Co., Clinton, Mass., has resigned to accept a similar position with the Saxonville Mill, Saxonville, Mass.

Clarence Bodfish has been appointed superintendent of the Bay State Mill, American Woolen Co., Lowell, Mass.

Fred Newberger has been appointed overseer of weaving at the Tillotson Mfg. Co., Pittsfield, Mass.

W. R. Bliven has accepted a position as overseer of carding at the South Bend Woolen Co., South Bend, Ind. He comes from Beaver Dam, Wis.

E. Robbins has accepted the position as overseer of spinning at the Somerset Woolen Co., Monson, Mass. He comes from Norwich, Conn.

Joseph McGowan has accepted the position as overseer of carding at the Darling Woolen Mill, Holliston, Mass. He was formerly employed at Hope Valley, R. I.

Harry Jackson has accepted the position as overseer of spinning at the branch mill of the Champlain Silk Mills at Brooklyn, N. Y., succeeding Samuel Holland.

Gustav Weder, overseer of carding at the South Bend Woolen Co., South Bend, Ind., has severed his connection with that company.

Arthur Heinlein has been appointed agent of the Felters Co., Millbury, Mass.

Benjamin King, superintendent of the Felters Co., Millbury, Mass., and Daniel P. Clark, assistant superintendent of the same plant, have severed their connection with that company.

Hugo Dolge has been appointed superintendent of the Felters Co., Millbury, Mass., succeeding Benjamin King.

Philip H. Manning, overseer of carding and spinning at the Cumberland Mill, Libbey & Dingley Co., Lewiston, Me., has resigned.

Frank F. Buckley has accepted the position as overseer of weaving at the Franklin Mills Corp'n, Unionville, Mass. He was formerly loom fixer at this mill.

John Heaton has accepted the position as overseer of finishing at the Somerset Woolen Co., Monson, Mass. He comes from Stafford Springs, Conn.

Watson T. Dunmore, Jr., overseer of carding at the New York Mills, New York Mills, N. Y., has severed his connection with that company.

John Lockwood has accepted the position as overseer of weaving at the worsted department of the Orr Felt & Blanket Co., Piqua, O. He comes from the Saranac Mill, Blackstone, Mass.

O. W. Merriott, overseer of dyeing at the Pawcatuck Woolen Co., Westerly, R. I., has sev-

ered his connection with that company. He is to retire from active business and has been in the employ of this firm for a great many years.

Joseph A. Clapp, superintendent of the Ayer Mill, Lawrence, Mass., has been appointed agent of the Prospect Mill, American Woolen Co., same city.

Ralph O. Inman, formerly agent of the Prospect Mills, American Woolen Co., Lawrence, Mass., has been appointed assistant agent of the Ayer Mill, same city.

M. J. Boland, overseer of dyeing at the Great Falls Woolen Co., Somersworth, N. H., has severed his connection with that company.

Herman Rosendale has succeeded his brother as superintendent of the Henbert Silk Co., Paterson, N. J.

David Ross, formerly a silk manufacturer at Paterson, N. J., has accepted a position as superintendent of the Auburn Silk Mills, Auburn, N. Y.

Heinrich Klerx, superintendent and manager of the several mills of the Susquehanna Silk Co., has severed his connection with that company. He will take a vacation abroad before engaging in business for himself.

John Jackson, formerly with the National & Providence Worsted Mills of Providence, R. I., and later superintendent of the Elston Worsted Co., of the same city, has been appointed agent of the Chester Worsted Co., of Chester, Pa.

John H. Gormley, assistant superintendent and designer at the Hoosac Worsted Mill, North Adams, Mass., has severed his connection with that company.

P. T. Donahue has accepted a position as overseer of finishing at the Henry F. Scatchard Mfg. Co., Norristown, Pa. He comes from Woonsocket, R. I.

Ralph O. Ingram has been appointed assistant agent of the Ayer Mill, Lawrence, Mass.

John E. Moffitt has been appointed overseer of spinning at the Rochdale Mill, American Woolen Co., Rochdale, Mass.

J. Arnold Cooper has accepted a position in charge of the mechanical department at the Rochdale Mill, American Woolen Co., Rochdale, Mass.

A Ferguson has been appointed master mechanic at the Fort Dummer Mills, Brattleboro, Vt. He comes from Franklin, N. H.

Arthur Jackson has been appointed superintendent of the Elston Worsted Co., Providence, R. I. He succeeds his father, John Jackson.

Charles E. Collins has been appointed agent of the Pemberton Mills, Lawrence, Mass. For several years Mr. Collins has been superintendent of the Methuen Cotton Mills and will continue his connection with them along with his duties at the Pemberton Mills.

John Ingham has accepted the position as overseer of dyeing at the Rochdale Woolen Mill, Rochdale, Mass. He comes from Maynard, Mass.

F. A. Marble, recently bookkeeper at the Rhode Island Woolen Co., Stafford Springs, Conn., has accepted a similar position with Geo. E. Sykes & Co., Hartford, Conn.

Jacob Becker has accepted a position with the R. H. Simons Silk Mill, Easton, Pa. He was formerly with Hess & Goldsmith Silk Co., Wilkesbarre, Pa.

James Bain has accepted the position as overseer of dyeing at the Bay State Worsted Co., Worcester, Mass. He comes from Winooski, Vt.

Fred Jackson, overseer of dyeing at the Bay State Worsted Co., Worcester, Mass., has severed his connection with that company.

Henry A. Browne, for a number of years overseer of weaving at the Hathaway Mill, New Bedford, Mass., has severed his connection with that company. A number of his associates presented him with a sectional book case.

Thomas Yates, formerly employed at the Gosnold Mill, New Bedford, Mass., has accepted the position as overseer of the cloth room at the Taber Mill, same city. He was presented with a beautiful writing desk as a testimonial of the esteem in which he was held at the Gosnold Mill by his associates.

Howard Holbrook, who has been bookkeeper at the Elmdale Mill, Uxbridge, Mass., has been appointed assistant superintendent of the plant.

F. W. Lane, who has been designer at the Indian Spring Woolen Mill, Madison, Me., has been promoted to agent, succeeding James McDougall, who has been transferred as agent of the mills of the American Woolen Co., at North Vassalboro, Me.

John A. Waugh has accepted the position as second hand of carding at the Walcott & Campbell Spinning Co., New York Mills, N. Y. He comes from Lonsdale, R. I.

Robert W. Van Tassell has been appointed chief engineer of the Massachusetts Cotton Mills, Lindale, Ga. He formerly held a similar position with the Shaw Stocking Co., of Lowell, Mass., for a number of years.

E. H. Ambach has accepted the position as overseer of carding at the Central Mills, Stafford Springs, Conn.

C. R. Blake, overseer of carding at the Tremont & Suffolk Mills, Lowell, Mass., has been appointed superintendent, succeeding the late John Dunn. E. E. Shelters has been appointed assistant superintendent, J. J. Rooney has been chosen to fill the position of superintendent of the yarn department. W. H. Thayer, paymaster, succeeding the late Mr. Chadwick. C. B. Winters, assistant paymaster. Allan Hatch, overseer of carding, taking the position which Mr. Blake formerly held.

H. D. Pickering, purchasing agent at the Tre-

mont & Suffolk Mills, Lowell, Mass., has been appointed assistant agent of the company.

Henry Roehm has been appointed superintendent of the Central Mill, Stafford Springs, Conn.

Thomas Johnson, superintendent of the Central Mill, Stafford Springs, Conn., has severed his connection with that company.

Albert A. Gordon, Jr., has been appointed superintendent of the Crompton & Knowles Loom Works, Worcester, Mass., succeeding William Wattie.

David W. Fox has been appointed superintendent of the J. D. Clark Co., Rochdale, Mass. Mr. Fox has been assistant superintendent and overseer of the weaving department at the mills for a long time.

Otto H. Muller, formerly with the Forstmann & Hoffmann Co., Passaic, N. J., and for the last two years with the Bigelow Carpet Co., Lowell, Mass., has accepted the position as overseer of combing and carding for the Hudson Worsted Co., Hudson, Mass.

J. W. Spillane, formerly second hand in the carding department at the Boston Duck Co., Bondsville, Mass., has resigned to accept the position as overseer of carding at the New Bedford Spinning Co.'s mill of the New England Cotton Yarn Co., New Bedford, Mass.

Gustave Weder has accepted a position as overseer of carding at the Hanover Woolen Mfg. Co., Hanover, Ill. He formerly held a similar position at the South Bend Woolen Co., South Bend, Ind.

Edward Robertson has accepted the position as overseer of spinning at the Garland Woolen Co., Staffordville, Conn.

Joseph Riel, master mechanic at the Sayles & Jenckes Mfg. Co., Warren, Mass., has resigned. He has returned to his old position as master mechanic for the Lymansville Co., Providence, R. I.

Howard A. Lewis has been appointed designer at the Indian Spring Mill, American Woolen Co., Madison, Me. He was formerly in the employ of the North Adams Mfg. Co., North Adams, Mass.

Joseph Petrain has accepted a position as second hand of mule spinning at the Aurora Cotton Mills, Aurora, Ill.

L. A. Abercrombie, superintendent of the No. 1 Mill of the Bibb Mfg. Co., Macon, Ga., has resigned to accept a similar position with the Fort Valley Cotton Mills, Fort Valley, Ga.

S. O. Fiedler, superintendent of the Lymansville Co., Providence, R. I., has resigned.

C. W. Parrott, overseer of spinning at the Victor Mills, Greer, S. C., has been appointed superintendent of the Gluck Mills, Anderson, S. C.

L. D. Green has been promoted from second hand to overseer of weaving at the Chadwick Mills, Charlotte, N. C.

T. W. Ingle has accepted the position as overseer of weaving at the Steele Mill, Rockingham, N. C. He comes from the Chadwick Mill, of Charlotte, N. C.

C. L. Duncan has accepted a position as overseer of spooling and warping at the Clinton Cotton Mills, Clinton, S. C. He comes from Williamston, S. C.

M. T. Sandford has accepted the position as overseer of spinning, spooling and warping at the Atlantic & Gulf Mills, Quitman, Ga. He comes from Rockingham, N. C.

Wm. Parker, Jr., has been appointed superintendent of the Standard Cotton Mills, Cedartown, Ga.

E. D. McCarthy has been appointed superintendent of the Savannah Cotton Mills, Savannah, Ga.

R. T. Comer, superintendent of the Fort Valley Yarn Mills, Fort Valley, Ga., has resigned to accept a similar position at the Pioneer Mills, Guthrie, Okla.

T. C. Gore has been appointed superintendent of the Athens Mfg. Co., Athens, Ga. He comes from Thomaston, Ga.

D. P. Rhodes has been appointed superintendent of the Osage Mfg. Co., at Bessemer City, N. C. He was formerly superintendent and secretary of the Rhodes Mfg. Co., of Lincolnton, N. C.

E. F. Wellman has been appointed manager of the French Broad Mfg. Co., Asheville, N. C. He was formerly superintendent of the Androscoggin Mills, Lewiston, Me.

J. P. McCraw has accepted the position as overseer of weaving at the Walterboro Cotton Mill, Walterboro, S. C. He comes from Clinton, S. C.

Arch Ennis has accepted the position as overseer of carding at the Elk Cotton Mills, Fayetteville, Tenn. He comes from Covington, Ky.

D. M. Smith, overseer of spinning at the D. E. Converse Co., Converse, S. C., has resigned to accept a position as assistant superintendent of the Clifton Mill, Glendale, S. C.

J. G. Barnhardt has accepted the position as overseer of weaving at the Pauline Mill, Kings Mountain, N. C. He comes from China Grove, N. C.

J. J. Edwards has accepted the position as overseer of spinning, twisting and winding at the Trio Mfg. Co., Forsyth, Ga. He comes from the Bibb Mfg. Co., No. 2 Mill, Macon, Ga.

L. H. Hambrick has succeeded J. J. Edwards as overseer of twisting and winding at the No. 2 Mill of the Bibb Mfg. Co., Macon, Ga.

S. C. Simmons, superintendent of the Pioneer Cotton Mills, Guthrie, Okla., has resigned.

J. T. Patterson, formerly boss finisher at the Bay State Mills, Lowell, Mass., has accepted a similar position at the Hillsboro Woolen Mills, Hillsboro, N. H.

Cornelius Donahue, for the past twelve years overseer of weaving at the Royal Mills, Riverpoint, R. I., has resigned. He will accept a similar position at the Stark Mill, Manchester, N. H.

A. S. Thomas, general superintendent of the I. E. Palmer Co., Middletown, Conn., has resigned.

P. W. McMahon, designer at the Louisville Woolen Mills, Louisville, Ky., has resigned his position and has returned to Providence, R. I.

Alfred Nelson has accepted the position as overseer of finishing at the Hodges Finishing Co., Dedham, Mass.

A. T. Wilde, overseer of spinning at the Hamilton Mfg. Co., Lowell, Mass., has resigned to accept a similar position at New Bedford, Mass.

Daniel O'Brien, overseer of weaving at the Corr Mills, East Taunton, Mass., has resigned and will accept a position in a similar capacity at New Bedford, Mass.

Frederick J. Norris, designer and overseer of weaving at the Wampanoag Mill, No. 2, Fall River, Mass., has resigned and has accepted a similar position at the Davol Mills, same city. On finishing his duties at the Wampanoag Mill, he was presented with a gold watch, fob chain and stick pin by the help. Joseph F. Cox succeeds Mr. Norris at the Wampanoag Mill, and Richard Bradley, loom fixer at the Barnaby Mill, takes the position of second hand at the Arkwright Mill vacated by Mr. Cox.

Frank S. Hoag, for the past 31 years superintendent and one of the owners of the Kinderhook Knitting Mill Co., Kinderhook, N. Y., has accepted the position as general manager of the Poughkeepsie, Milton and Cold Spring plants of the C. H. Hoag Co., whose principal plant is located at Poughkeepsie, N. Y.

Joseph C. Maillous has been engaged by the Manville Co. as overseer of the weaving department of that corporation's large mill at Manville, R. I., succeeding Peter Trahan.

C. W. Hubbard, treasurer of the Ludlow Mfg. Co., Ludlow, Mass., for the past 25 years, has resigned. He will continue with the company as secretary and a member of the board of trustees. His resignation necessitated a complete reorganization and the following officers have been elected: Cranmore N. Wallace, president, executive head and selling agent; Sidney Stevens, second vice-president and manufacturing agent, and Frederick S. Bowen, third vice-president and head of the fiber department.

Charles R. Riley, president of the H. & B. American Machine Co., Pawtucket, R. I., was elected president of the Booth Mfg. Co., New Bedford, Mass., to succeed the late George S. Homer.

Thomas Thomas has been appointed superintendent of the Orr Felt & Blanket Co., Piqua, Ohio. He comes from the Bay State Mills, Lowell, Mass.

Eli Nield, superintendent of the Booth Mfg. Co., New Bedford, Mass., has resigned. He is succeeded by Stephen D. Bennett.

Albert W. Thomas, formerly of Lowell, Mass., has been appointed superintendent of the Lowell Machine Shop.

John E. Richardson, superintendent of dyeing and finishing at the Ravenna plant of the Cleveland Worsted Mills, Cleveland, Ohio, for 13 years, has been appointed manager of the mills of the Richardson-Foster Co., Pawtucket, R. I.

Joshua Craven has accepted the position as superintendent of scouring, carding and combing at the Lorraine Mfg. Co., Pawtucket, R. I.

C. L. A. Heiser, secretary of the Manville Co., Providence, R. I., has resigned. His successor is I. B. Merriman.

John A. Sullivan, who has been overseer of spooling and warping for many years at Mills No. 1, 2, 3, 4 and 5 of the Fall River Iron Works, Fall River, Mass., has been transferred to Mills Nos. 6 and 7. He is succeeded by Michael Kelly of the Richard Borden Mfg. Co.

William Dunn, overseer of the card room at the Felters Co., Millbury, Mass., for the past 11 years, has resigned.

Henry Stott, for the past five years overseer of carding at the Clark Thread Co., Newark, N. J., has severed his connection with that company.

J. H. Thomas, overseer of weaving at the French River Textile Co., Mechanicsville, Conn., has severed his connection with that company.

J. B. Meacham, formerly at Hickory, N. C., has been appointed superintendent of the Fidelity Mfg. Co., Charlotte, N. C.

Henry Schrimpshire, overseer of spinning at the Huntsville Cotton Mills, Huntsville, Ala., has resigned. He is succeeded by G. W. Russell.

Lem Cook has been promoted from second hand to overseer of weaving at the Lowe Mills, Huntsville, Ala.

The following overseers have been appointed at the Osage Mfg. Co., Bessemer City, N. C.: J. L. Kerley, overseer of carding; Frank H. Whisnant, overseer of spinning; Charles L. Eppley, overseer of weaving, and D. P. Harding, master mechanic.

At the Wariota Mills, Nashville, Tenn., S. T. Kerr has been appointed overseer of spinning and T. A. Wantland overseer of carding.

J. W. Eddy has been appointed superintendent of the Bibb Mfg. Co., Columbus, Ga.

Thomas Hall has been appointed superintendent of the Bibb Mfg. Co.'s Mill No. 2 at Macon, Ga., and J. R. Plunkett has been appointed superintendent of the No. 1 Mill of the Bibb Mfg. Co., at Macon.

J. R. McMahan has accepted the position as overseer of spinning at the Franklin Mills, Arlington, S. C.

I. S. McManus has accepted the position as overseer of spinning at the Efird Mill, No. 1, Albemarle, N. C.

Tom Jones has accepted the position as overseer of spinning at the Girard Cotton Mills, Girard, Ala.

S. E. Ferguson, overseer of weaving at the Belton Mills, Belton, S. C., has resigned to accept a similar position at the Fulton Bag & Cotton Mills, Atlanta, Ga.

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Personals.

James Smith, formerly with the W. H. Phelps Co., Columbus, O., has accepted a position as overseer of winding at the Bradley Knitting Co., Delavan, Wis.

Robert E. Jackson has accepted the position as overseer of carding at the LaTosca Knitting Co., Utica, N. Y.

Paul F. Fay has accepted a position as overseer of finishing at the Old Fort Knitting Mills, Fort Wayne, Ind. He comes from Lowell, Mass.

C. H. Oakes has become associated with the Mohawk Valley Cap Factory at Utica, N. Y. Mr. Oakes was formerly superintendent of the Frisbie Hosiery Mills at Oneida, N. Y.

Homer Emery has accepted a position as overseer of carding in the cotton mill of the Troy Knitting Co., Cohoes, N. Y. He was formerly superintendent of the cotton mill of John K. Stewart & Sons, Amsterdam, N. Y.

DEATHS

John J. Haden, a former silk manufacturer of Paterson, N. J., died January 16th, following an operation, at the age of 44 years. He was a loom fixer by trade, and was employed for years with the Bamford Bros. Mfg. Co., of which firm he became superintendent. He engaged in business for himself afterwards but gave it up after several months.

John Dunlap, Sr., a retired carpet manufacturer, died January 16th at the home of his son, John Dunlap, Jr., at Wayne, Philadelphia, from a stroke of paralysis at the age of 80 years. He was one of the first to recognize the benefit in weaving carpet by machinery, and for many years conducted a factory at 11th and Cambria Sts. The mill closed a few months ago. Mr. Dunlap is survived by two sons and a daughter.

George A. Fischer, superintendent of the Colonial Ribbon Co., Paterson, N. J., died January 17th of pleuro-pneumonia, at the age of 42 years. For many years he was a foreman in the employ of the National Ribbon Co., before becoming associated with the Colonial Ribbon Co. He had always been prominent in politics and was formerly alderman. Mr. Fischer is survived by a widow and two children.

Max Schulman, a wealthy embroidery manufacturer of Spring Valley and New York, was killed in Nyack, N. Y. In attempting to board a moving train for New York he fell under the wheels.

John P. Kearns, superintendent of the National Silk Dyeing Co., Paterson, N. J., died recently at the age of 46 years. He is survived by a widow and one son.

John Taylor, for the past 22 years overseer of spooling and dressing at the Merrimack Mfg. Co., Lowell, Mass., died recently of heart disease.

George S. Homer, president of the Booth Mfg. Co., New Bedford, Mass., died at his home in that city on January 8, of pneumonia. For many years he was engaged in the oil and candle business, and for a time was the proprietor of the Evening Journal. He was one of the oldest directors of the Merchants Bank. Mr. Homer is survived by a widow and a brother.

William H. Miles, formerly agent of the Farwell Mills, Lisbon, Me., died at the St. Marie Hospital in Lewiston, Me., on January 15, at the age of 70 years. After finishing his education he entered the employ of the York Mill at Biddeford, Me. He then went to Lowell to one of the large mills where he was found at the breaking out of the Civil war. Mr. Miles enlisted at once and served throughout the war, gaining the rank of first lieutenant. Later on he accepted a position as overseer of the card room at the Farwell Mill, Lisbon, Me., but after seven years of service he was promoted to the position of agent. Here he remained until nine years ago, when he resigned. One son and two daughters survive him.

Kennedy B. Dowsley, for a number of years associated with the Hudson Valley Knitting Mills, died at his home in Troy, N. Y., recently, at the age of 68 years. He retired from active work a few years ago.

Amos D. Smith, a well known manufacturer of Providence, R. I., died January 22 of pneumonia at his home in that city at the age of 77 years. After graduating from the Brown University, he entered the employ of his father and uncle, who conducted an extensive cotton business under the name of A. D. & J. Y. Smith & Company. Later he joined his father as a partner in the firm of Amos D. Smith Company, agents and directors of manufacturing corporations. The firm organized the Whitestone Mills in 1883 and operated the old mill property until 1896 when it was sold to the state of Rhode Island for an armory site. Shortly after the organization of the Whitestone Mills, Mr. Smith became a member of the firm of Smith Brothers, manufacturers of cotton dress goods. He was president and treasurer of the Whitestone Mills and very prominent in other lines of business.

Robert Laycock, a well known mill man, died recently at his home in Lawrence, Mass., at the age of 68 years. He had been confined to his home by paralysis for 18 months. He was for several years wool buyer for the Atlantic-Delaine Mills, Providence, R. I., and during recent years was superintendent of the wool department of the Washington Mills of Lawrence.

Charles A. Ricon, one of the pioneer glove manufacturers of the United States, died recently at his home in West Hoboken, N. J., at the age of 86 years. He came to the United States from Germany, 50 years ago, and was one of the founders of the glove firm bearing his name. He retired from business 30 years ago.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

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New Mills.

*North Carolina, Charlotte. E. A. Smith advises that he and his associates have simply applied for a charter for the E. A. Smith Mfg. Co. and have no organization or location. Plans have not yet been matured. This is a $300,000 cotton mill project to make fine cloth. Mr. Smith recently disposed of his holdings in the Chadwick-Hoskins Co., but retains the office of president of the Oconee Mills Co. of Westminster, S. C. Robt. Lassiter, who is one of the incorporators of the new E. A. Smith Mfg. Co., is treasurer of the Oconee Mills Co.

*North Carolina, Charlotte. A meeting was held this week in Fall River in the office of Fuller & Gray to prepare articles of incorporation for the new cotton mill to be built at Charlotte, and to be known as the Thayer Mfg. Co. Among the incorporators are Albert A. Jenks of Pawtucket, R. I.; Leon W. Campbell of Woonsocket, R. I.; O. A. Robbins, Charlotte; Wm. E. Fuller, Jr., Wm. H. Jennings, J. T. Lincoln, James Marshall, L. Lincoln and B. B. Read, Jr. Jonathan T. Lincoln will be elected president; O. A. Robbins, treasurer; Wm. E. Fuller, Jr., clerk, and C. B. Skipper, who is to be superintendent, will be one of the directors. Fine goods and specialties will be manufactured and the mill will have 25,000 spindles and 500 looms.

*Texas, Post. H. W. Fairbanks, in charge of the cotton mill project of C. W. Post, will come East again during the next month and by the first of February will have completed full and complete details of the plant. Mr. Fairbanks' address in the future will be Post, Tex.

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Enlargements and Improvements.

*Alabama, Alabama City. The installation of new looms to replace old ones at the plant of the Dwight Mfg. Co. is being completed. New spinning frames were recently installed.

Connecticut, Danielson. The Quinebaug Co. are to install dobby heads and warp stop motions on 224 looms. Recently dobby heads were placed on 10 of the old looms in order to make a new line of goods.

*Georgia, Atlanta. The new 2-story weave shed, 100 by 213 ft., for the Exposition Cotton Mills, has been completed at a cost of about $20,000. Work was started on this addition last September.

*Georgia, Barnesville. Work is being completed on the 2-story brick mill, 100 by 160 ft., under construction for the Aldora Mills. The new mill will be equipped with looms for weaving the production of the company's 10,000-spindle yarn mill. This is one of the improvements which were decided upon at a meeting of stockholders early in the summer, when it was voted to expend approximately $150,0000 for enlargements and improvements. The new mill will be driven by electric power from the lines of the Central Georgia Power Co.

*Georgia, Columbus. The installation of new machinery in the carding department of the Eagle & Phenix Mills is in progress. No further enlargements to the plant is contemplated as a result of the recent increase in capital.

*Georgia, Covington. Manufacturing has been started on the additional equipment, which it was reported several months ago would be installed by the Covington Mills. The plant now contains 22,000 spindles and 600 looms, an increase of about 25 per cent.

*Maine, Lewiston. Plans of the Bates Mfg. Co. for the extensive enlargements previously reported include the building of a 1-story weave shed with saw-tooth roof on what is known as the old Pingree lot, which will practically cover the entire lot to the boundary lines. The lot is of an irregular shape and contains 4 1/2 acres. It is further planned to connect the two main mills, which are now separated by a distance of about 100 ft., by the construction of a section 100 ft. long and 100 ft. wide, 5 stories high. In connection with these enlargements it will be necessary to develop additional power and the company is considering the installation of a new water power plant above the present electric power plant. It is planned to begin work this spring just as soon as the condition of the ground will permit. Just how much will be done this year it is impossible to state, but the company hopes to start these operations in the early spring, building at least a portion of the new buildings this year and probably installing additional water wheels to give a small additional amount of power. Eventually 75,000 spindles and probably 2,000 looms will be added. The Bates Mfg. Co. has declared a semi-annual dividend of 5 per cent., payable February 1.

*Massachusetts, Easthampton. Changes in No. 2 Mill of the West Boylston Mfg. Co. include improvements in the carding, combing and spinning departments and the installation of about 4,400 new spindles.

Massachusetts, Fisherville. An addition to the cotton house of the Fisher Mfg. Co. is being built. According to the new plans cotton will be blown over the spur railroad tracks into the bins in the picker room. The new addition will be 1 story high, with cement foundation and brick walls. George W. Smith, overseer of the yard, has charge of the work.

Massachusetts, Williamstown. Two large water wheels have been installed in the Greylock Mills, Mill B, and are now furnishing 550 h. p. each. A force of men has been at work for a long time installing the flumes in which the water is conveyed from the pond east of the mill to the wheels.

*New York, Lockport. The new weave shed of the Niagara Textile Co. will be in operation soon.

*New York, Sherburne. Work of building the addition to the yarn mill of the Utica Knitting Co. is going steadily on and the respective buildings will be completed by early spring. It has been noted that this department of the Utica Knitting Co. is being about doubled.

*North Carolina, Asheville. Probably $50,000 will be expended by the Asheville Cotton Mills for the previously reported improvements to be made in connection with the resumption of manufacturing. Included in the improvements are a new dye house and new houses for operatives. At a recent meeting of shareholders Fred W. Cone of Baltimore was elected president; M. D. Long, Asheville, secretary and treasurer, and George R. Murphy, superintendent.

North Carolina, Henderson. Machinery is being installed in the new mill of the Henderson Cotton Mills recently completed, including 5,000 spindles, 20 cards, winding equipment, etc. Individual motors will drive the spinning frames.

*North Carolina, Hickory. A total of 7,680 new spindles with preparatory equipment comprises the recently reported increase being made by the Ivey Mill Co. The new equipment will be in operation before the end of February. G. H. Geitner is president of this company; A. A. Shuford, secretary and treasurer, and G. F. Ivey, superintendent and buyer. A. D. Juilliard & Co. of New York are the selling agents.

South Carolina, Greenwood. Additional equipment for No. 2 Mill of the Grendel Mills is being installed and will be in operation before the first of February. The enlargement includes 3,000 spindles, 5 cards and other preparatory machinery.

South Carolina, Newberry. In addition to installing some new preparatory equipment the Mollohon Mfg. Co. is changing over its plant from steam power to electricity.

*South Carolina, Whitmire. Contract has been awarded for excavating for the new mill to be built for the Glenn-Lowry Mfg. Co. T. C. Thompson & Co. will build the mill.

*Tennessee, Shelbyville. In addition to ordering new spinning frames and looms, other improvements at the Sylvan Cotton Mills to be made consist of the installation of electrical power equipment.

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Mills Starting Up.

Massachusetts, Fall River. Cotton has been started through the pickers in the new Pilgrim Mills, but it will be some weeks before the plant is ready for complete operation.

*Mississippi, Batesville. The Panola Cordage Co., which succeeded the Batesville Yarn & Cordage Co., has capital stock of $40,000 and has organized with Dr. G. H. Woods, president; M. W. Roberson, treasurer, and J. B. West, agent, manager and buyer. The plant contains 1,600 ring spindles on which a high grade of S. I. twine, carpet warp, variegated twines and 3-ply rope are manufactured.

*South Carolina, Greenville. Machinery in the card room of the new Westervelt Mills is being put in condition with the expectation of starting cotton through it during the coming week. The power has been turned on. This is a $1,000,000 company which will operate 50,000 spindles and 1,200 looms on fine lawns and linons.

South Carolina, Rock Hill. The plant of the Harriss Mfg. Co. has been leased by the Victoria Cotton Mill and will be started up at once on coarse yarns. There are 2,000 spindles in the mill.

Tennessee, Columbia. The Columbia Cotton Mill Co. started its plant this week for the first time in 21 months. New officers and directors are to be elected shortly.

Texas, Brenham. Last week the South Texas Cotton Mill began manufacturing with a force of 100 operatives. This company succeeds the Brenham Cotton Mill which was sold out last May and bought in by a number of the former stockholders and reorganized with D. C. Giddings, president; H. F. Kolwes, vice-president; D. C. Williams, secretary, and C. W. Wainwright, superintendent.

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Mills Shutting Down.

Connecticut, Danielson. The Danielsonville Cotton Co.'s plant has been shut down. This mill, which has made a specialty of the manufacture of fine cotton goods and has employed in ordinary times about 700 hands, has done very little for several months and for the past few months has employed less than 50 hands on special work. It has been repeatedly rumored that the property is to be taken over by new interests.

WOOLEN.

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New Mills.

Pennsylvania, Philadelphia. William Kimmerling, president of the late Kimmerling Mfg. Co., has leased the third floor in the Cope Mills at Wayne Junction, in which he is installing 20 broad looms, recently purchased by him from Long Bros., in this city. The new plant will be run on dress goods.

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Enlargements and Improvements.

Canada, Nova Scotia, Amherst. Frank Stanfield, managing director of Stansfield's, Ltd., is president of the reorganized Hewson Pure Wool Textiles, Ltd., and H. L. Hewson of Amherst is vice-president and manager. $150,000 cumulative, 7 per cent. preferred stock and $250,000 6 per cent. bonds are offered for sale. It has been noted previously that the plant would be enlarged in the spring.

*Connecticut, Bridgeport. Contract has been awarded by the Salt's Textile Mfg. Co. for the new 1-story building, for which it was reported previously plans had been drawn. The new building will be a weave shed, 100 by 165 ft., with a concrete floor and saw-tooth roof. A new 625 h. p. turbine engine was recently installed and it is reported the company contemplates installing another turbine of similar type to provide power for the increase in equipment that is expected. The new turbine drives a generator which supplies power for the smaller motors throughout the factory. In the weave room the looms are driven by individual motors. L. H. Gager of Worcester prepared the plans.

Connecticut, Poquetanuck. B. Lucas & Co. have had their mill wired for electric lights. A dynamo was recently installed and last summer a 150 h. p. steam engine was put in. Fine all wool dress goods are manufactured on 4 sets and 28 looms. N. Everett Lucas is superintendent and buyer.

Connecticut, Staffordville. The Fabyan Woolen Co. will install 20 new and 12 second hand looms in its local plant, according to report.

Maine, Lisbon Falls. Machinery is being set up in the 4-story addition built to the mill of the Worumbo Mfg. Co. during the past year and includes 2 cards imported from Germany and 16 Crompton & Knowles looms which will be driven by individual motors. Electricity will be developed in the new dynamo room constructed during the past year. Most of the machinery has been ordered and it is expected within a few days. The addition to the dye house, which was started early in December, is nearing completion, and is designed to handle the cloth produced in the addition to the main mill which will be largely dress goods. This enlargement to the dye house is 20 by 40 ft., of the same height as the present dye house.

*Massachusetts, Holyoke. The new weave shed of the Farr Alpaca Co. is practically completed and will increase the capacity to 3,000 looms. It is understood that new spinning and preparatory equipment will be required when the new weave shed is filled up with looms.

*Massachusetts, Rochdale. The addition being built for E. G. Carlton & Sons will be ready for machinery in about 10 days. This enlargement is located opposite the main building and across the French River. It is of concrete and wood, 2 stories high, 90 by 30 ft., and will be reached from the main mill by a boxed bridge across the river. The building was made necessary by lack of space in the finishing department of the original building and when completed a rearrangement will be made throughout the mills. The lower floor of the new building will be used entirely for dry finishing and the upper floor will be for spinning and dressing departments. Dry finishing machinery will be removed from its present location and some new equipment added. The wet finishing department also will be rearranged and some additional equipment installed. In other departments of the main mill there will be minor changes. All the concrete work, which comprises the first story of the addition, is completed, and the carpenters are expected to finish the second story, which is of wood, in about 10 days. When they are through, work will begin on the rearrangement of departments, and it is expected all changes will be made by February 1.

*Minnesota, Fergus Falls. At the annual meeting of the Fergus Falls Woolen Mills it was decided to issue $10,000 new stock and to add to the plant. The officers were reelected as follows: I. J. Boyum, president, and A. G. Anderson, treasurer. Flannels, blankets, ribbed underwear and fancy knit goods are manufactured.

New Hampshire, Guild. Fairbanks & Dorr, proprietors of the Granite State Mills, are putting in 10 more looms. Shirtings are manufactured on 11 sets and 100 looms.

Pennsylvania, Chambersburg. A new smoke stack will be erected at the plant of the Melville Woolen Co.

Pennsylvania, Philadelphia. Recently an increase was made at the Sprague Worsted Mills, doubling the number of looms. This concern began manufacturing about a year ago with 24 looms and the recent increase gives a total of 48 looms. The plant is being operated to full capacity.

Pennsylvania, Philadelphia. It is reported the Andrew's Mill Co., Inc., will install 40 additional looms. The company is very busy and is running overtime.

Rhode Island, Harrisville. A consolidation has taken place between the Stillwater Worsted Co. of Greenville and the worsted dress goods and men's wear departments known as No. 2 Mill of Sidney Blumenthal & Co., Inc., at Shelton, Conn. In November the organization of the Stillwater Worsted Co., with capital stock of $450,000, was reported and this corporation is the company into which these two mills have been joined. Sidney Blumenthal is president; Austin T. Levy, treasurer, and F. B. Manley, superintendent of manufacturing. Mr. Levy will attend to the buying as heretofore. In the new quarters at the Harrisville Mill, the company will have 191 broad looms, giving largely increased facilities for the various classes of goods heretofore produced by the two mills. Preparations have already been started for removing, but this work cannot be completed until the end of February.

West Virginia, Terra Alta. It has been decided to rebuild the Terra Alta Woolen Mills, but definite plans will not be made before summer. The plant was burned to the ground last July with loss estimated at $50,000, and $20,000 insurance.

*Wisconsin, Jefferson. About May 1 the proposed addition to the Jefferson Woolen Mill, owned by John E. Owen & Son, will be made and the increase in equipment will include 1 set of 48-inch cards and 480 spindles. They recently added 6 knitting machines for making woolen tubing.

Mills Starting Up.

Massachusetts, Rochdale. It is reported the Rochdale Woolen Mills will be started up by the American Woolen Co. very shortly. It is expected that wool will be started through the preparatory machines before the end of the month and that before the end of February the plant will be employing its full quota of help.

*New Hampshire, Gilsum. Samuel G. Hall, who formerly operated the Mt. Battie Mill at Camden, Me., and later leased the Kent Mill at Jamesville, Worcester, heads the Gilsum Woolen Co., incorporated a few weeks ago with capital stock of $10,000 to operate the Collins Mill in Gilsum. The people of Gilsum will subscribe to some of the stock of the new company and manufacturing will probably be started within a few weeks.

Washington, Ellensburg. Power has been turned on in the new plant of the Washington Woolen Mill Co. Some of the machinery, which was moved from the Western Woolen Mills at Topeka, Kans., has been installed.

KNIT.

New Mills.

*Canada, Ontario, Hamilton. It is probable the Canadian Co., Ltd., will begin the production of goods about the middle of March. Good progress has been made on the construction of a mill on which work was started late in November, and it will be ready shortly for the machinery equipment, which will consist of 33 knitting machines and 42 sewing machines, besides complete dyeing and finishing department for making men's, women's and children's flat and ribbed underwear. Electric drive will be used. The mill is located at the corner of Catherine and Burlington Sts. in a good location for manufacturing and will be modern in every detail. This concern was organized last October, and has authorized capital stock of $300,000. J. M. Harris is president; R. R. Simpson, treasurer; W. H. Magill, manager and buyer, and F. X. Monette, superintendent.

*Maine, Ellsworth. Work has been started on putting the old Union Shoe Factory into condition for use by the new knitting company, which is a reorganization of the Quaker Mfg. Co. of Lewisburg, Pa. It will be necessary to install shafting, and a bleach house and box factory will be equipped. The new company will be known as the Bloods Knitting Mill. Chas. L. Morang has been elected president; John Blood, Jr., vice-president and general manager; John O. Whitney, treasurer, and Edward F. Small, clerk. It is expected the mill will be in operation by March 1.

Massachusetts, Boston. A new concern is manufacturing knit goods at 463 Commercial St., under the style of the Beacon Knitting Co. Sweaters, jerseys and bathing suits for men, women and children are being made on 22 knitting machines. Men interested were formerly connected with the Suffolk Knitting Co. of Chelsea, which recently removed to East Boston.

Massachusetts, South Framingham. The knitting plant being established in the Minard Building by Brown, Durrell Co., will be operated on a very small scale for the present.

*New Jersey, Paterson. The Silk City Knitting Co., incorporated several months ago with capital stock of $10,000, is manufacturing knitted neckwear on 25 latch needle and 6 flat knitting machines at 130 Broadway. Theo. Strassner is superintendent and buyer. 2/50s cotton and different sizes and grades of silk are bought.

New York, New York City. The Arrow Knitting Mills, which have leased the top loft at 358 W. 18th St., manufacture knitted silk neckwear on 20 knitting machines. Ben Bangser and Harry Simon are the proprietors.

Pennsylvania, Newport. Emory O. Smith has started a hosiery plant and is manufacturing men's cotton hosiery and stocking feet under the style of the E. O. Smith & Bros. Hosiery Mills. He has 6 knitting machines, 3 loopers, 1 ribber and 1 hot press. The plant is run by water and steam power. From 8s to 14s cotton and 40s and 50s splicing yarn are used.

Pennsylvania, Philadelphia. Messrs. Bartman Brothers have installed six knitters at 2d and Callowhill Sts., on which they are manufacturing a line of knitted silk neckties. They finish and sell direct.

Pennsylvania, Philadelphia. The Novelty Cravat Company have fitted up a plant at 106 South 11th St. with 11 knitters which they are operating by electric power on fine silk knitted neckties. They sell direct.

Pennsylvania, Philadelphia. The Laurel Knitting Company, not inc., are equipping a plant at 73-79 Laurel St. with 10 knitters and 2 sewing machines, on which they will manufacture a line of high grade silk knitted cravats, to be sold direct to the jobbing trade. William Bennett, at one time engaged in the knitting business at American and Diamond Sts., is president, and H. H. Lilley, superintendent and manager.

Pennsylvania, Philadelphia. The E. M. Manufacturing Co., E. R. Branson, proprietor, have equipped the third floor of the building at 813 Locust St. with knitting machines, on which they are manufacturing a line of high grade knitted neckties. The product is sold direct.

Pennsylvania, Philadelphia. S. Portner has installed 8 knitters and 1 sewing machine at 257 Market St., on which he is manufacturing a line of high grade silk neckties. Electric power is used. The production is sold direct.

Pennsylvania, Reading. It is reported that Irwin Neff, now engaged in the manufacture of shirt waists at 316 Penn St., will manufacture children's union suits and is looking up equipment for a plant to contain about four to six knitters, to be operated on this line of goods.

Pennsylvania, Reamstown. The Hope Hosiery Co. of Adamstown, Pa., has started a branch mill in Reamstown. Thirty-eight knitting machines, 6 ribbers and 2 loopers for making 144-needle cotton half hose have been installed and are being operated by power from an oil engine. C. Ansell is in charge as superintendent. The product is shipped to the main mill to be dyed and finished.

Enlargements and Improvements.

Canada, Nova Scotia, Eureka. The Nova Scotia Knitting Mills, Ltd., are contemplating an addition to the present plant to enable them to increase their output. There are prospects that work on the new building will be started as soon as the weather permits.

*Canada, Ontario, Galt. In addition to constructing an enlargement to be used for drying, the Galt Knitting Co., Ltd., has installed a hydro-electric power plant as an auxiliary to the steam power plant. They have recently added and are still adding considerable equipment to the plant generally. The capital stock is $200,000. C. R. H. Warnock is president and treasurer; A. Unger, secretary and buyer, and James Knechtel, superintendent. Underwear and knitted specialties are manufactured on 6 sets wool cards, 20 knitting machines and 107 sewing machines.

Connecticut, Addison. Material is being brought here for the new addition to the plant of the Glastonbury Knitting Co.

Delaware, Wilmington. Chas. Taylor Co., Inc., will rebuild their hosiery plant destroyed by fire some time ago.

Illinois, Kankakee. The Paramount Knitting Co. is putting up an addition to the boiler room of the local plant. New power equipment will be installed. Seamless hosiery is made in this branch on equipment of 2 sets of wool cards, 20,000 cotton spindles, 700 latch needle knitting machines and 200 ribbers. The product is dyed and finished here. Frank Pope is the superintendent. The main office of the Paramount Knitting Co. is in the Hunter Bldg., corner Madison and Market Sts., Chicago. Henry Pope is president and K. Kelly, purchasing agent.

Indiana, Hammond. Plans are being made for increasing the capacity of the Hammond Knitting Co. The capital stock also will be increased. Details will be known in from 15 to 30 days. Edward Friend, formerly president of the concern, is no longer connected with it. Fred Friedlander is secretary and treasurer. Fifty flat knitting machines and 12 ribbers are operated on gloves, mittens, sweater coats and novelties.

*Massachusetts, Boston. It is expected the Oakes Knitting Mills Co., recently incorporated to take over the business of the Oakes Knitting Mills of West Roxbury, will increase the plant. Worsted knit goods are manufactured on 35 sections of full fashioned machines. Owen F. Oakes is president and buyer.

*Michigan, Bay City. The remodeling of the building at 11th and Jackson Sts. recently purchased by the Vassar Knitting Works of Vassar, Mich., has been completed and the concern will remove here from Vassar about the first of February.

Minnesota, St. Paul. Larger quarters at 282 E. 7th St., corner of Rosabel, have been leased by the Minnesota Knitting Mills Co. They are adding more machinery and intend to make further increase during the next sixty days. Sweater coats for men, women and children, cardigan jackets and toques are manufactured. This concern was formerly known as the North West Knitting Mills of Brooklyn, N. Y.

New Hampshire, West Stewartstown. Several months ago it was reported that J. Edward Fenner would manufacture heavy socks from coarse homespun yarns. Mr. Fenner is now interested in buying coarse machines suitable for manufacturing heavy lumbermen's socks and wants second hand 3/4 or 7/8 automatic machines about 4 1/4 to 5 inches in diameter with 60 to 72 needle cylinders.

New Jersey, Woodbine. The South Jersey Knitting Co., which has been manufacturing a line of fancy knit goods and ladies' sweater coats on 14 knitters and 12 sewing machines, has installed additional machinery on which they are manufacturing high grade knitted silk neckties which will be sold to the jobbing and large retail trade by S. Marku, 223 Drexel Building, Philadelphia.

New York, Utica. In the Richelieu Mill No. 1 of the Frisbie & Stansfield Knitting Co. a high pressure filter with capacity of 300,000 gallons per day was recently put in operation.

New York, Brooklyn. M. Miller, proprietor of the Fashion Knitting Mill, has increased the equipment to 25 flat knitting machines and 15 sewing machines. Men's and women's jackets, vests and bathing suits are manufactured.

New York, Brooklyn. Francis H. Mayhew, manufacturer of knitted neckwear at 397 Bridge St., has increased his equipment to 30 knitting machines.

New York, Norwich. The Norwich Knitting Co. has bought the real estate and machinery of the Erskine Ribbon Co., which recently decided to liquidate, and will remove its plant to the ribbon factory, which is a larger building. The stockholders have voted $50,000 new stock to be used in expanding the company's business. Underwear, sweater coats, tubings and glove linings are manufactured.

New York, Valatie. The equipment in the knitting department of the Adhesive Gimp Mfg. Co. has been increased to 8 hand machines, 15 flat power machines, 16 circular power machines and 25 sewing machines.

*North Carolina, Haw River. The 50 by 150 ft. new mill of the Regina Hosiery Mfg. Co. is completed and is being equipped with 80 knitting machines for manufacturing men's and women's hosiery. A dyeing and finishing department also is being installed.

North Carolina, Newton. The Fidelity Hosiery Mills, Inc., have added 10 234-needle machines since succeeding the Newton Hosiery Mill and contemplate other improvements.

Ohio, Cleveland. Contract for a new building to be occupied by them has been awarded by the Cleveland Knitting Mills Co., manufacturers of sweaters, sweater coats, shawls, scarfs and novel-

ties. The building will be of reinforced concrete construction, 4 stories high, with about 13,000 sq. ft. of floor space on each floor. The walls on all four sides are to be of the all-glass Finestra type. The building is to be equipped with automatic sprinkler system and will have all modern appliances for the safety and convenience of the employes as well as for facilitating the manufacture of the company's product. The building will be erected this spring. Decision as to what additional machinery will be installed has not been made. Herman H. Neuman is president; Jerome N. Halle, treasurer, and Louis Neuman, secretary. The present plant is at 5518-5524 Euclid Ave.

*Ohio, Toledo. An increase will be made in the capital stock of the Dolphin Hosiery Co. in February. Four knitting machines were recently installed and it is planned to make a further enlargement.

Ohio, Youngstown. The style of the Self-Supporting Hosiery Co. has been changed to the Banner Hosiery Co. At present 6 knitters, 2 loopers, 1 ribber and 1 sewing machine are operated, but they intend to increase the plant soon. Lisle, mercerized and silk hosiery is produced.

Pennsylvania, Fleetwood. Chas. A. Wanner has added a line of 220-needle silk goods and increased his equipment by the addition of 20 knitting machines.

Pennsylvania, Fleetwood. The Ritter Hosiery Co. reports business as fair on a line of 200-needle mercerized hosiery. Recently 2 new ribbers were installed.

Pennsylvania, Fleetwood. D. F. Kelchner is changing some of his machinery from 144-needle half hose to 176-needle goods. He has also increased the number of ribbers to 18 and loopers to 12.

Pennsylvania, Mohnton. Ten new knitting machines have been added to the plant of A. S. Hornberger & Co. Seamless half hose and Swiss ribbed underwear for women is manufactured.

Pennsylvania, Mohnton. J. J. Eshelman & Co., manufacturers of cotton half hose, have doubled their equipment in all departments and now have 28 knitters, 4 loopers and 7 ribbers, all on 144-needle goods. The concern buys 9s to 40s yarn.

Pennsylvania, Philadelphia. The Puritan Knitting Mills of Pennsylvania, manufacturers of sweater coats and shaker knit coats, are removing their plant from 61 and 63 N. 2d St. to 313 Arch St., where they have secured considerably larger quarters. It is understood that a number of new machines will be added for the purpose of increasing their production.

Pennsylvania, Philadelphia. Messrs. Sheplan & Sabul, who are now located at 534-36 N. 3d St., where they are manufacturing dress, window shade and upholstery trimmings, and also operating a number of knitters on silk neckties, have recently acquired possession of the three-story brick building at the S. E. corner of Randolph St. and Fairmount Ave., where they will have 6,800 square feet of space in which to conduct their operations in the future. A number of new necktie knitters have been added and possibly other machinery will be put in after the firm removes to the new address, after the first of February.

Pennsylvania, Philadelphia. Messrs. Kartman & Pels, operating the United States Trimming Co., at 1410 N. 6th St., in addition to their regular line of gimps, tassels and dress trimmings, have installed a number of knitting machines on which they are making a line of fine silk knitted and crocheted neckties, which they are selling direct.

*Tennessee, Knoxville. The Appalachian Mills recently moved into their new mill. Changes have been made which give the plant the most modern facilities and capacity of 700 dozens of garments daily of men s two-piece underwear. They have about 50 knitting machines and 150 sewing machines and employ approximately 225 hands. They contemplate installing a spinning plant in the future and expect to have a mill of about 10,000 spindles. This matter has not been decided positively, but is being seriously considered as they are very large purchasers of cotton yarns.

Virginia, Virgilina. The capital stock of the Virgilina Hosiery Mills, Inc., has been increased to $12,000 and the equipment has been increased to 41 latch needle knitting machines and 8 ribbers. Seamless cotton hosiery is manufactured. H. C. Crowell is president; S. M. Torian, treasurer, and J. Will Lowrey, superintendent and buyer. The mill was started last August.

West Virginia, Martinsburg. Plans for large improvements to the mills of the Kilbourn Knitting Machine Co. are not in shape for a detailed report. For the last five years this company has been adding to the buildings and machinery equipment, constantly increasing the capacity, and during this time more or less changes in this direction have been under way all the time.

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Mills Starting Up.

Michigan, Perry. The Perry Glove & Mitten Co., which has been closed for two months, has resumed manufacturing with a full force of help.

New York, Catskill. The plant formerly operated by the Malcolm Knitting Co., recently taken over by the Union Mills, will be operated by the latter concern as Department C. Cotton fleeced underwear will be made. It will be some weeks before the mill is in operation. The equipment consists of 7 sets of wool cards, 1,920 cotton spindles, 54 spring needle knitting machines and 100 sewing machines.

New York, Sauquoit. The Adrian Knitting Co.'s branch plant here is being started up and it will soon be running on full time. This is a branch of the Adrian Knitting Co. of Adrian, Mich.

SILK.

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New Mills.

*Maine, Portland. A charter has been granted the Portland Silk Mills Co. with capital stock of $50,000. The incorporators are G. A. Roeth, Dale Ave., Paterson, N. J., Luther B. Roberts and

Frank D. Marshall of Portland. It has been previously reported that negotiations were under way for the erection of a silk mill on what is known as the Henry Taylor Estate at East Deering. This property is owned by Mr. Roberts. Frederick A. Tompson, a mill architect in the Y. M. C. A. Building, Portland, is at work on plans for a 2-story building, 50 by 100 ft. These plans will be given to contractors next week for figures and if bids are reasonable there is no doubt that construction work will be started at once.

New Jersey, Paterson. Abbot Bros., located in the Broomhead Mill, have taken the floor recently vacated by the International Silk Co.

*Pennsylvania, Mayfield. Henry Kellerman has secured land on which to build his proposed new plant and plans for the building have been drawn. Construction work will be started about March 1. Mr. Kellerman has resigned as superintendent of the Mayfield Silk Co., of which he is also vice-president, after holding that position for eight years. He retains his financial interest in the company. It is understood that all arrangements for the organization of the new company have not been completed and that Mr. Kellerman is seeking additional capital. He is interested in complete equipment of machinery and supplies.

Pennsylvania, Philadelphia. The Globe Textile Company, F. J. Maloney manager, have equipped the one story brick building in the rear of 2834 Boudinot St. with 6 narrow looms, 5 knitters and 3 sewing machines on which they are manufacturing woven silk novelties and high grade silk knitted neckwear. They sell direct. Silk, art silk and mercerized yarns are bought.

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Enlargements and Improvements.

*New Jersey, Newark. Work is going forward on the additions recently reported to the plant of Kaltenbach & Stephens, and according to plans the buildings will be equipped ready for manufacturing about April 1. These improvements will cost about $30,000, instead of $18,000, as given in an earlier report, and include a 3-story drying room, 16 by 80 ft.; a 1-story dye house, 40 by 64 ft., and a 1-story boiler house, 30 by 30 ft.

*New York, Fultonville. A night and day schedule is in force at the temporary quarters of the Mohawk Silk Fabric Co., whose plant was destroyed by fire in December. Some new machinery is being installed and put in operation as fast as mechanics can set it up.

*North Carolina, High Point. Unfavorable weather has retarded the work on the new silk weaving department which Stehli & Co. are building. Operations are being pushed along as fast as possible and it is expected the mill will be ready for operation by the middle of March. This department will have capacity of 300 looms and it is rumored the weaving mill at Paterson is to be moved to High Point.

Pennsylvania, North Wales. The addition recently built to the spun silk mill of Chas. Stringer is completed and several imported machines have been installed. Mr. Stringer reports more orders than he can fill at the present time.

*Pennsylvania, Philadelphia. Preparatory work is now under way for the construction of the 5-story brick building to be erected for the Orinoko Mills. The new mill will be 44 by 50 ft. and will cost in the neighborhood of $20,000.

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Mills Starting Up.

Pennsylvania, Kutztown. D. G. Dery, a manufacturer of dress and lining silks with mills in Catasauqua and other places, has leased with the privilege of purchase the plant which has been run previously by the Hill Silk Mfg. Co. of Paterson, N. J. The plant has been shut down since January 1, but Mr. Dery states that it will be started up at an early date.

MISCELLANEOUS.

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*Connecticut, Ansonia. The new 5-story, concrete factory building being constructed for the Ansonia O. & C. Co. is on the site of an old mill which was not suited for their use. Elastic webbings, shoe and corset laces, braids, cords, tapes, etc, are manufactured. The New York office is at 350 Broadway.

Connecticut, Bridgeport. Plans are being drawn for a new mill for the Bias Narrow Fabric Co., of brick mill construction, with granite trimmings, tar and gravel roof, and to contain about 25,000 square feet of manufacturing space. It is expected the mill will be built this spring.

Connecticut, Middletown. The addition to the plant of the Russell Mfg. Co., on which work was started some time ago, is practically completed. It will have equipment of 60 looms for weaving webbing.

Connecticut, Norwich. A new steam turbine has been installed in the plant of the United States Finishing Co. Brick layers are at work on the new addition being built to replace a part of the plant.

Georgia, Chickamauga. A 3-story addition, 40 by 70 ft., of concrete construction, is being erected to the plant of the Crystal Springs Bleaching Co. and will be used to enlarge the sizing and mixing rooms. D. A. Jewell is president and treasurer and A. E. Yates, superintendent.

New Hampshire, Somersworth. New machinery equipment is being installed in the Great Falls Bleachery & Dye Works and will be ready to start up about February 1.

Pennsylvania, Allentown. Pickup & Kean, Inc., have added Foster coning machines for dyed and mercerized skein yarns to take care of the silk, hosiery and yarn trade. A Swiss mercerizing plant was installed recently.

Pennsylvania, Allentown. It is reported the local plant of the National Silk Dyeing Co. will be doubled.

*Pennsylvania, Manheim. The new addition to the plant of the United States Asbestos Co. is

completed and weaving, spinning and preparatory equipment is being installed.

Pennsylvania, Philadelphia. Oehrle Bros. & Co., operating a plant for the manufacture of upholstery trimmings, rope portieres, etc., at 425 N. 3d St., have recently equipped a small plant in the rear of their building for the dyeing of their silk yarns. A son of one of the members of the firm is in charge.

Pennsylvania, Philadelphia. Considerable interest is being shown in the report that a charter has been applied for by the General Processing Co., which it is said will acquire the business of the Dragon Dye Works, located at Amber St. and Allegheny Ave. It is the purpose of the new company to immediately make additions to the present buildings and equipment. In addition to operating departments for dyeing, bleaching and winding, it is also said to be their purpose to specialize on English methods of mercerizing skein yarns.

Pennsylvania, Philadelphia. The Fern Rock Bleachery, which equipped the building at 2018-24 E. Willard St. with an equipment for bleaching hosiery, underwear and knit goods, have shut down the plant and are removing the machinery, which they are offering for sale. The plant will not be started up again.

Pennsylvania, Reading. Lesher & Smith recently acquired the building at 3d and Bingamen Sts., formerly used as an abbatoir. The building is being remodeled and equipped for bleaching cotton piece goods and hosiery, and when in operation will be one of the largest and most up-to-date plants of the kind in that vicinity.

Pennsylvania, Reading. Recently the equipment of the Reading Towel Mfg. Co., whose mill is located at Hyde Park, was increased to 17 looms. The concern manufactures Turkish towels and has capital stock of $15,000. John R. Giebel is president and treasurer and Samuel Keller, superintendent. Within a short time it is planned to enlarge the bleachery and take up the bleaching of cotton piece goods for the trade. At present the plant is very busy.

Pennsylvania, Royersford. Chas. S. Madeira and Samuel F. Peters of the Pennsylvania Dye & Bleach Works, Pottstown, have leased the Royersford Dye & Bleach Works. They will take possession at once and make a number of improvements, including the installation of some new machinery. The plant is being operated under the style of the Snow White Bleachery, bleaching hosiery and underwear. Samuel F. Peters is president; Chas. S. Madeira, treasurer and buyer, and Oliver Krasley, superintendent.

Pennsylvania, Spring City. A new embroidery company, whose name has not been given out, is building a plant in this town in which machinery for the manufacture of Swiss embroideries will be installed. Two machines have been ordered for the initial equipment.

Rhode Island, Pawtucket. The Acme Finishing Co. has been incorporated to manufacture, bleach, dye, print and finish textile fabrics with capital stock of $225,000. Frank H. Cranston will be president; J. E. Judson, treasurer, and Alfred L. Lustig, general manager. The new company will take over the former Harrison Yarn & Dyeing Co.'s mill on Front St. and after making some alterations will do a business of dyeing and printing fine fabrics, cotton and silk and cotton mixed, for the general trade. Operations will be started some time in the spring.

*Rhode Island, Phenix. About February 1 the Phenix Braid Mill will resume manufacturing after a shutdown since last September. C. O. Carpenter, Apponaug, R. I., is president, and H. W. Barber, Phenix, is treasurer and buyer. Shoe laces and braids are manufactured.

FIRES.

Maine, Skowhegan. The dye house of the Marston Worsted Co. has been destroyed by fire and the main mill damaged somewhat by smoke and water. Plans are being made to rebuild the dye house as soon as possible and in the meantime their dyeing will be done elsewhere. Manufacturing is to be resumed immediately. The burned dye house was a wooden structure about 175 ft. long.

Massachusetts, Lawrence. Fire in the picker room of the Pemberton Co. caused considerable damage to the machinery and stock.

Massachusetts, Oxford. Fire destroyed the Oxford Woolen Mills of A. Howarth & Son, causing loss which is estimated at $75,000. The large 3-story brick building and several smaller buildings were burned to the ground. The fire started in the main mill and spread rapidly because of lack of water. Part of the loss is covered by insurance and it is stated the mills will be rebuilt. Five sets and 38 broad looms were operated on white flannel. The company's larger mill at Rochdale was recently disposed of to the American Woolen Co.

Massachusetts, Webster. A loss of about $4,000 was caused by fire in one of the spinning mills of S. Slater & Sons.

New York, Brooklyn. A fire which started in the plant of the Liberty Knitting Mills, S. Sheindelman Co., 28 Boerum St., destroyed the 3-story building in which the plant was located and caused loss, including damage to adjoining property, of $75,000. Bathing suits, sweater coats, etc., were manufactured in the Liberty Knitting Mills on 60 knitting machines and 22 sewing machines.

New York, Whitesboro. Fire and water caused several thousand dollars' damage at the Alliance Knitting Mills of Chas. A. Powell.

Ohio, Cleveland. Fire in the dyeing and drying department of the Collings, Taylor Co. caused them a loss of about $15,000, fully covered by insurance. They will put up a new building to replace the burned structure, which will be entirely fireproof, and expect to rush the work and have the new department ready for operation within a few weeks. This will put them in much better shape to take care of their trade than they ever were before.

New Publications

(Any work noticed under this head can be obtained through the office of this journal.)

Works Management; by William D. Ennis, M. E., Professor of Mechanical Engineering in the Polytechnic Institute of Brooklyn; 194 pages, 6 by 9; McGraw-Hill Book Co., 239 West 39th St., New York. Price $2.

This work is the latest addition to the literature of industrial efficiency. The author deals with the subject under the following heads: Management Units, Cost Elements and Classifications, Statistical Records, Labor, Material, Burden, Depreciation, Industrial Organization, Principles of Accounting, Plant: The Physical Basis of the Industry. The book is adapted for class-room instruction, and for this purpose a number of exercises have been added in the appendix.

The Sheep Industry in Canada, Great Britain and United States; by W. A. Dryden and W. T. Ritch, commissioners appointed by the Canadian Government; 187 pages, 6 by 10; published by the Minister of Agriculture, Ottawa, Ontario.

This is a valuable addition to the literature relating to wool. Messrs. Dryden and Ritch were appointed two years ago to investigate the sheep industry in Canada, Great Britain and the United States. They visited the countries named, studied the industry personally, as well as collecting a large amount of data from various sources in the respective countries. We met Mr. Ritch during his visit to the United States and were impressed with the painstaking care with which he was conducting the inquiry. A copy of this report should be in the hands of everyone interested in the growing or manufacture of wool.

The Strength and Elasticity of the Wool Fiber; by J. A. Hill, of the Wool Laboratory of the University of Wyoming Experiment Station; 139 pages, 5 1/2 by 8 1/2.

This is a report of an extensive series of tests to determine the strength and elasticity of the wool fiber. It is divided into the following sections:—1, Preliminary studies which led to the adoption of some of the statistical methods in use by biometricians; 2, Study of the variability of the means of sub-samples of 100 fibers each, drawn from unmixed samples; 3, Study of the variation of the means of sub-samples of 1,000 fibers each, drawn from unmixed samples; 4, Study of the variation of the means of sub-samples of various sizes, drawn from samples which had been mixed in different ways to facilitate the drawing of random sub-samples, but which were of the same general size as the samples used in the previous sections; 5, Study of the variation of the means of sub-samples of various sizes drawn from well mixed samples which were locks so small that they scarcely contained any more than the number of fibers required for the sub-samples drawn from them; 6, A comparative study of the results of the studies of the previous sections.

Heaton's Annual; The Commercial Handbook of Canada, 1912; Heaton's Agency, 32 Church St., Toronto, Canada; 397 pages, 5 by 7 1/2. Price $1.

The eighth edition of this annual has recently been published and includes a number of improvements, with the regular features brought up to date. The following abstract from the table of contents shows the scope of the work: Directory of the Canadian Government, Postage Rates, Financial Information, Commercial Regulations, Credit Reports and Collections, Transportation, Customs Information, Descriptions of Towns and Local Opportunities, General Information, Money, Weights and Measures.

Weaving Machinery (Die Webereimaschinen); by A. Wickardt, Director of the Bramsche Weaving School; 248 pages, 7 by 10 1/2; Verlag von Bernh. Friedr. Voigt, Leipzig, Germany. Price $3.50.

This work contains an illustrated description of the machinery for weaving and also preparing yarn for the loom. There are chapters describing the machinery used in finishing. The concluding chapter deals with power, light and the heating plants. Both hand and power looms are described. The text is in German.

Catechism of Weave Construction (Katechismus der Bindungslehre); by Emil Bittner; 798 pages, 5 1/2 by 9; Bruenner Monatschrift fuer Textilindustrie, Bruenn, Austria; two volumes. Price $10.

This elaborate treatise on weave construction has been prepared for self-instruction and also for use in weaving schools. It is a remarkable example of the high quality of German works relating to textile manufacturing. The two volumes contain 1,252 illustrations, nearly all of which are weave drafts. The weaves are classified not only according to weave construction, but also according to the fabrics for which they are used, and in the case of combination or double weaves separate drafts are given for the weaves thus obtained. A brief explanation accompanies each weave. In a separate part of the book there is a series of 671 questions and answers relating to the weave drafts and cloth construction, this part being especially valuable for students. The work also contains an account of cost finding, comparative yarn tables and textile calculations. Much valuable information regarding the manufacturing of different classes of goods will be found in this book, which must be examined to be appreciated. While the text is in German the drafts alone make the work of great value to English readers. Each alternate page is filled with blank squares like the ordinary design paper, enabling additional weaves to be inserted. There is also a separate blank book of 19 pages ruled off to receive the samples of cloth and a record of the class of goods and corresponding weave. The work can be seen at our Boston office.

BUSINESS LITERATURE

The Slater Mills at Webster; The Slater Mfg. Co., Webster, Mass.; 37 pages, 8 1/2 by 12.

This interesting pamphlet has been issued in connection with the centennial of the Slater Mills founded at Webster, Mass., in 1812. It was in 1890 that the first Slater centennial was celebrated at Pawtucket, where Samuel Slater established the first cotton mill in America in 1790. This pamphlet contains an interesting account of the establishment of the early Slater industry and its development down to the present time. It contains a number of illustrations, including portraits of Samuel Slater and his successors, views of the first mills and of those now in operation.

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Piping Materials; The Best Manufacturing Co., Pittsburg, Pa.

This is the 1912 catalogue showing the products of the Best Mfg. Co. and also additional material usually included in power plant piping equipment. A number of new features have been introduced in this catalogue, which simplifies it as a reference book. A separate section deals with dimensions, making it very important to both the purchasing and engineering departments. There is also a very complete section devoted to general engineering information. A copy of the book should be in the possession of every user of piping materials.

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Automatic Sprinkler Bulletin, General Fire Extinguisher Co., Providence, R. I.

This quarterly publication, devoted to the interests of fire prevention from the standpoint of the automatic sprinkler, contains a great deal of detailed information regarding the actual operation of sprinklers in cases where fires call them into action. The January number is a particularly interesting one, carrying with it digests of the reports of the Chambers of Commerce of Rochester, N. Y., and Boston, Mass., both of which declare very strongly for the installation of automatic sprinklers, particularly in cases where fires would endanger large numbers of lives, or would threaten to spread into a conflagration. The Bulletin, which is full of pithy items, will well repay careful reading by anyone whose interests are at any time liable to be threatened with destruction by fire, and will be sent regularly to anyone who desires it.

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The Sterling Air Cooler and Purifier; Thomas & Smith, Inc., 116 N. Carpenter St., Chicago, Ill.

These folders give a description of the Sterling for cooling and purifying the air. It consists of a portable apparatus which washes and cools the air for work rooms and offices. Tests show that in summer the fresh air taken into the washer at 93° F. is cleansed, cooled and delivered at a temperature of 76°, when using city service water at 72° F. The Sterling apparatus is built in different sizes, with capacities ranging from 125 to 5,000 cubic feet fresh air per minute.

CALENDARS

The H. & B. American Machine Co., Pawtucket, R. I., builders of cotton machinery, are sending out an attractive calendar which shows a picture of their works.

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The Arlington Machine Works, Arlington, Mass., have sent out to the trade an attractive office calendar.

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The Miller Manufacturing Co., dealers in high-grade soaps and oils, 668 Eddy St., Providence, R. I., are sending out a very pretty calendar for office use.

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Grosser Knitting Machine Co., 260 West Broadway, New York, are sending out to the trade a very beautiful calendar on which is reproduced one of Dobson's famous paintings entitled, "The Hand that Rocks the Cradle Rules the World." This painting represents one of those humble interiors for which the artist is now famous. The light from a deep recessed window falls upon the central figure, a comely young matron whose busy fingers are knitting a stocking. At her foot is a cradle in which slumbers a little baby, whose presence doubtless accounts for the beautiful expression on the mother's face. Under the shadow of the window sill a little boy with a horn spoon partakes of his simple fare—a bowl of porridge. On the stone floor, warmed by the glow from the fire, lies the faithful Collie dog, in that position which might be termed "sleeping wakefulness." The "crusie" hanging on the wall shows that the "light of other days" is still used in this humble abode. Simple though the surroundings be, we know that Burns spoke truly when he said, "From scenes like these old Scotia's grandeur springs."

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The Niagara Thread Co., 120-24 S. American St., Philadelphia, Pa., who have become well known to the knitting trade as specialists in threads for their use, have issued an attractive calendar. In addition to containing information as to the wares manufactured by this concern it also contains a telephone directory which is of value to any office.

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The Schofield Woolen Co., Ltd., Oshawa, Ontario, Canada, manufacturers of unshrinkable underwear for men, are sending out to the trade a wall calendar on which is reproduced their trade mark, a picture of St. George.

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The Wisconsin Textile Mfg. Co., Two Rivers, Wis. A calendar mounted on a form representing a cone bobbin. The location of this company in the heart of the timber lands affords special advantage for supplying the trade. This firm manufactures hosiery boards, glove and mitten forms, bobbins and spools for every purpose.

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The Whitin Machine Works, Whitinsville, Mass. A very neat calendar with a page for each month

and on which is illustrated the machines manufactured by this concern.

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The Acme Knitting Machine and Needle Co., Franklin, N. H. A very handsome calendar suitable for either office or library, and on which is mounted a pretty water color.

Industrial Notes

CUTTING MACHINES

The Oswego Machine Works, Oswego, N. Y., manufacturers of cutting machines for the textile and other industries, report that they have recently installed one of their new Oswego Auto Rapid production cutting machines in the mill of the Amoskeag Mfg. Co., Manchester, N. H.

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OFFICE LOCATION IN LOUISVILLE

Owing to their fast increasing business in Louisville, Ky., the H. W. Johns-Manville Company have found it necessary to move their offices from the Lincoln Savings Bank Bldg. to 205 Paul Jones Bldg. These new and more spacious quarters are much better adapted to their requirements. The office will be in charge of Mr. J. R. Crowning, who is well and favorably known throughout that section, having traveled in that section from the Milwaukee office a considerable time.

A complete line of well-known J-M asbestos and magnesia products, electrical supplies, packings, pipe coverings, roofings, etc., will be handled from this office.

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NEW BUILDINGS OF THE GOULDS MFG. CO.

The completion of the three new buildings of the Goulds Manufacturing Company, Seneca Falls, N. Y., was celebrated Friday evening, the 19th, by a grand ball, given by The Goulds Mutual Benefit Association. The two new machine shops used for the ball, were handsomely decorated and equipped with special illumination for the occasion. One was used for dancing and the other was fitted up for the dining hall and cloak room. It also contained card tables for those who did not care to dance.

From 8 until 10 P. M. a concert was given by Conway's Band of Syracuse, N. Y., after which the floor was cleared for dancing. The new hard maple floor had an excellent surface and there was plenty of room for all, although over two thousand were present. Supper was served by a caterer and here, too, the large crowd was well provided for. Everyone reported a most enjoyable time and the association, which is an organization for the benefit of sick members, made a handsome profit from the proceeds.

ALFRED SUTER MOVES TO LARGER OFFICES

Alfred Suter, the well known textile engineer of 487 Broadway, New York, has just returned from an extensive trip in Europe among the many textile machinery manufacturers whom he represents. He has made several new connections and looked up a great deal of new machinery, which will be put on the market in a short time. Mr. Suter's business, having grown so much in the past year and needing very much more room, he is to move to the 5th Ave. Bldg., 23d St. and 5th Ave., Room 853, on February 1st. Here he will have practically two rooms, one in which he can show his varied machinery in operation, the other to be used as an office. He hopes to see many of the manufacturers interested at any time at his new quarters.

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"CARRIER" HUMIDIFYING SYSTEM FOR STOCK ROOMS

The Standard Bleachery Company, Carlton Hill, New Jersey, has recently purchased from the Buffalo Forge Company, equipment for cooling, humidifying and ventilating the large stock room connected with their plant. The equipment consists of a 120-inch "Buffalo" steel plate fan, driven at 210 r. p. m., a "Carrier" air washer and humidifier, and heaters for tempering the air. Thirty thousand cubic feet of air per minute is delivered to the stock room, which provides for a five minute air change. The purpose of the apparatus is to cool the air in summer considerably below that of the outside atmosphere and to keep the humidity nearly constant the year round.

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DRY GOODS COURSE

The class in Dry Goods will open Jan. 22, 1912, at 3.30 P. M., in Eaton Hall, 48 Boylston St., Boston. Sessions will be held from 3.30 to 5.30 o'clock on Monday and Friday afternoons. The tuition is free. The course of study includes: Lectures and discussions on textiles, their fibers, processes of manufacture, and finished product; the textile trade, its customs and organization, salesmanship, efficiency training. Further information can be obtained from Chester M. Grover, Dry Goods Continuation School, 48 Boylston St., Boston, Mass.

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HECHT & CAMPE, INC., LEASE NEW QUARTERS

Hecht & Campe, Inc., selling agents for a number of mills manufacturing men's fleeced, rib and balbriggan underwear, women's and children's Richelieu and Swiss ribbed underwear, also a most comprehensive line of sweaters, sweater coats and jerseys, have found it necessary to enlarge, and have leased the entire fourth floor of the Haggin Bldg., 377-379 Broadway, with a floor space of about 8,000 square feet. This space will be devoted entirely to their offices and salesrooms. They sell to the jobbing trade exclusively.

AUTOMATIC SPRINKLERS

One of the surprising features of fire insurance during the past fifty years has been the wonderful decrease in cost of insurance, due almost entirely to the development of fire protection devices, and especially to the automatic sprinkler. The annual cost per hundred dollars of insurance written in the decade from 1850-1860 was 43.73 cents. The cost in the decade 1901-1910 was 6.76 cents. This represents a decrease of no less than 84.5 per cent., and covers in each case not only the fire loss but the total insurance cost. Every decade in the intervening period shows a very marked reduction in cost over that preceding, but the downward tendency has been greatest since 1881, at which time the automatic sprinkler was beginning to make its presence felt. The actual fire loss of 1908, 1909 and 1910 averaged only 1.72 cents per hundred dollars of insurance written, as against 33.41 cents for the first decade mentioned.

REMOVAL

The Heller & Merz Co. have removed their offices and warehouse to 503-505 Hudson St., New York City.

RUSSIAN AUTUMN WOOL CLIP

From Consul General John H. Snodgrass, Moscow

The Russian autumn wool clip for 1911 was less than for 1910, owing to the decrease of the flocks, food being so expensive in certain localities that the number of sheep was reduced in some instances from 30 to 50 per cent. This was particularly the case in Astrakhan and in some parts of the Don territory and western Siberia.

A general diminution is noticed in the flocks throughout the entire Empire and sheep breeding is on the decline. The principal causes are: Insufficient pasture owing to the increasing prices of land, high rental value, and a succession of droughts during the summer months in many parts of the country. This retrograde movement in sheep culture is particularly noticeable in the Province of Tobolsk, where the farmers have been compelled to dispose of their flocks.

It is believed that in general the quality of the autumn clip is satisfactory and compares favorably with that of former years. From some sections, however, it is reported that the high winds and the abundance of dust due to the dry weather have filled the fleeces with dirt. The clip per sheep in the majority of cases is equal to that of 1910, the average being 2 to 4 pounds per head.

In the regions where wool is bought for local uses the demand was slow because of the crop failure and the shortage of money, but in the sections where wool was purchased for foreign consumption the demand was lively, although prices were low at the start. In the majority of cases the prices of 1910 were equaled and in some cases they were exceeded.

The following figures indicate in a general way the prices adopted by the wool committee of the Moscow Exchange Bourse, taking effect on Oct. 29, 1911: Spanish fleece wool washed by machine, 56 to 62 cents per pound; Zigai wool, 14 to 16 cents per pound; Russian washed fleece wool from beyond the Volga and Don, 17 to 21 cents per pound; Russian autumn-clip wool, 12 to 24 cents per pound; camel's wool, 15 to 22 cents per pound; goat's down fleece, 24 to 39 cents per pound.

CONSULTING ENGINEER

Maurice Deutsch, civil and consulting engineer, has moved his office from the 19th floor to the 16th floor at 50 Church St. The partnership of Opdycke & Deutsch was dissolved at the beginning of the year. Mr. Deutsch will specialize in hydraulics and in the design and supervision of construction of foundations and subaqueous work by the pneumatic caisson, the freezing process and other methods, reinforced concrete work, mining shafts to depths below water up to 2,000 feet. In 1908, through the courtesy of the German and Austro-Hungarian governments, he was given an exceptional opportunity for studying the most improved European method of deep subaqueous excavation by the freezing process, Kind Chaudron and other methods. He also during the past six years made a number of investigations of vibrations in textile mills, factories and other buildings, and testified as expert in important litigations involving the question of vibrations. Mr. Deutsch has a staff of competent inspectors and experiences in the inspection of pneumatic caisson foundation work and general engineering inspection.

REMOVING DUST FROM CARD ROOMS

The question of dust removal in card rooms is one that seems to be agitating manufacturing circles in Great Britain to some extent at the present time and a committee of the Master Spinners' Federation and the Card Room Amalgamation recently arrived at the conclusion that the weight of a portable combined stripping roller, cover and dust remover, should not exceed 60 pounds. The old type of stripping roller weighs alone 50 to 60 pounds, but Messrs. Dronsfield Bros., Ltd., of Oldham, have brought out a new and lighter stripping roller to meet the demand.

This new roller is composed of sections of strong tin tubes, soldered together and strengthened internally by a number of metal discs. To these discs are secured small brass sockets, into which are driven small wooden plugs. These plugs are trimmed flush with the roller surface. The roller is fitted with iron ends, and the shafts are hollow drawn steel, well supported inside the roller barrel.

Constructed in the manner above described, it will be evident to all practical readers that this light roller is specially adapted for use in connection with all varieties of dust removing strippers in which the rollers have to be enclosed in a hood or cover, a fact that tends to make them unduly heavy. In fact we understand the reduction in the weight of the roller more than compensates for the weight of the cover. Apart, however, from their application in the above capacity, these rollers are a great improvement on the wooden ones in use up to the present time. They may also be used for other purposes with equal advantage,

where lightness and strength are essential. For this reason Messrs. Dronsfield Bros. make them in various sizes.

SCOURING PIECE GOODS

It is an obvious fact that before goods can be put on the market, scouring is a necessity at some stage of their manufacture. It may be in the raw material or in the woven piece, or, as is often the case in both. Piece scouring is both a mechanical and a chemical process. Now what is the object of scouring? The object of scouring is the removal of dirt, grease and other foreign matter, without injury to the material, or without any detrimental effect on the colors in the piece. The scouring operation follows the weaving, perching, knotting, mending and of course the other necessary stages. A piece fresh from the loom possesses qualities which it was the object of scouring to remove, that is, in addition to the thorough cleansing from grease and other impurities. Those qualities are (1) harshness of handle; (2) threadiness. These qualities should always be removed in the scouring process with perhaps one exception, i. e., in the canvas cloths, which should be kept as thready as possible. Softness or fulness of touch should be imparted to the piece and the colors should be left clear and bright, and also with the surface of the fabric free from creases. Pieces when impregnated with soap were then in a favorable condition for felting, and it should be remembered that felting is not an essential part of the scouring process. Some allowance must be made for the shrinkage which takes place in this process, when determining the shrinking. It should be remembered also that it is a great evil to scour goods at too high a temperature, because the wool fabric when in contact with hot water softens, swells, and becomes plastic, in which condition it may be formed into any shape desired. When a piece is treated in this way it is almost impossible to avoid creases. On the other hand, the temperature must not be too low, as a certain heat is necessary to bring about a good scour and a bright appearance on the piece. The temperature of the scouring water should not go higher than 100° to 110° F., and during the scouring process, especially with worsteds and cross breds, a constant opening out is necessary in order to change the running.

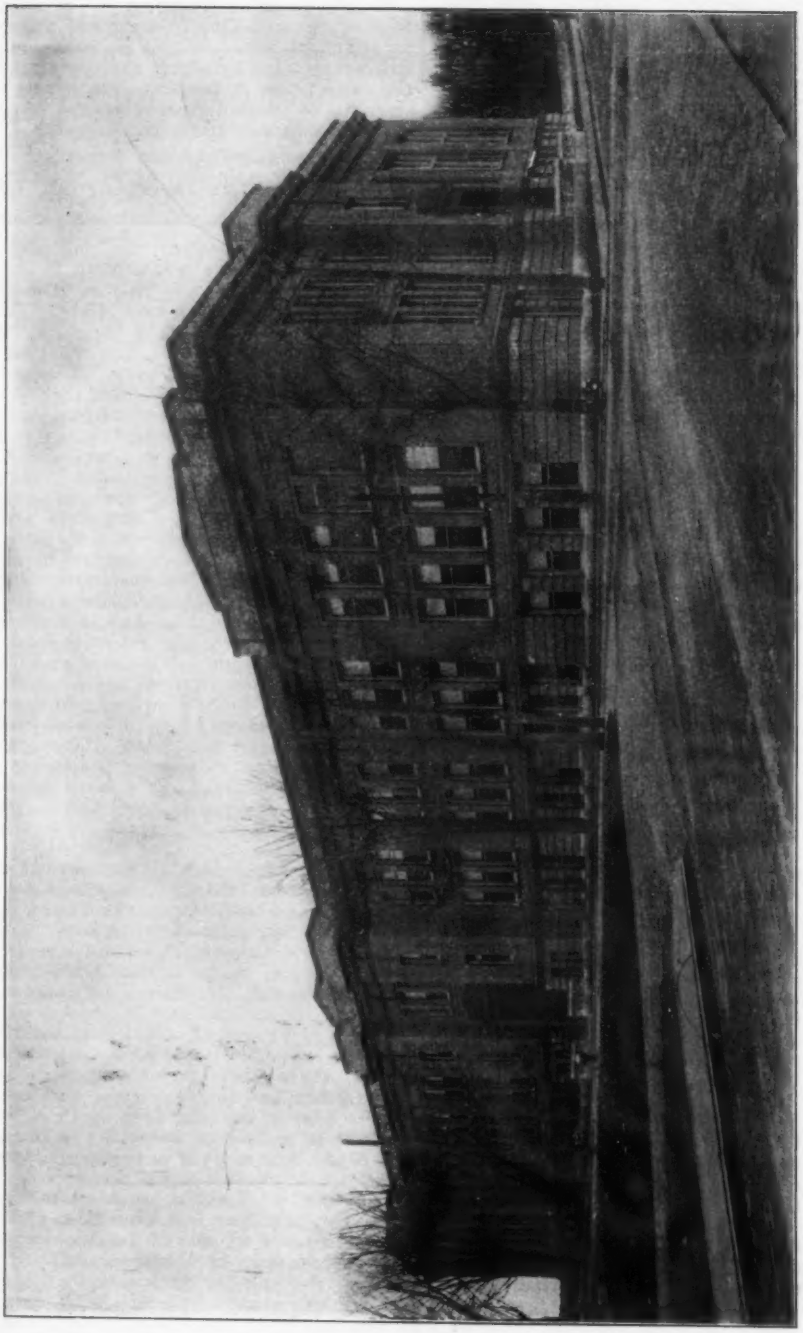
The general method of scouring the majority of cloths is with alkalis, and carbonates of soap, which if not too concentrated and the temperature at which they were used not above 104° F., little or no injurious action on the fiber takes place. Carbonate of soda and potash, if too strong, impart a dulness to the fiber, and also have a tendency to leave the goods with a harsh handle. This remark applies more in the case of soda, and care should always be taken not to add too great a strength to the scour, as once the handle has been effected there is no means of recovering that desired quality. The fuller's earth scour is a mechanical scour and of limited application. There is yet another method through the medium of volatile agencies, but the practice is very young as yet, and though there is the advantage that the natural oil could be distilled and easily recovered, the practice is both expensive and dangerous.

The scouring process varies greatly, according to the weight and also the weave. For instance, for a cloth roughly speaking from 18 to 21 ounces, with an average length of 60 to 70 yards, half an hour is long enough in the scour. This remark does not apply to the very heavy, close milled cloths, such as box cloths. Having already touched upon the evils of scouring in too strong a solution, it is well to mention another evil which is known as "flooding." When a piece is started no more liquid should be used than is necessary to wet the goods, or show the scour at the back of the scouring machine rollers. The soap is by this method worked in conjunction with the oil in the piece. A further advantage is the considerable saving of materials. When, however, oiline is used as a lubricant for the wool, it is then possible to scour the cloth by the use of alkaline only; 20 per cent. by weight of soda ash, and 25 per cent. by weight of pearline. A piece which has been blended with a good oiline should make its own soap with the addition of alkali.

The question of soap is one upon which plenty of argument had been expended and which is a somewhat open one. During actual experience with the use of both bar, soda and potash soaps, it was found that for general all-round use, potash soap was the best. Again, soda and potash are two similar alkalis, soda having the tendency of working the wool fiber rather harsh, and potash having the opposite tendency. When scouring fancy pieces, strong alkali should never be used, for besides the danger of causing the colors to "run," it is very injurious to bright colors. The excessive use of alkali makes the fabric lose some of its strength and elasticity. To sum up, the best effects in scouring are to be obtained by getting rid of the dirt as soon as possible, that is, of course, in conjunction with cleanliness, and avoiding working in the scour any longer than was necessary. Water plays a very important part in scouring, and hard water, loaded with lime, magnesium, etc., should be softened and freed from those constituents. For every 1,000 gallons (10,100 lbs.) at 15 per cent. of hardness, 20 lbs. of soap is necessary in order to reduce the water to the desired softness.

There are several types of scouring machines on the market at the present time, but it would be necessary only to mention the two most important. There was the ordinary dolly type, and the scroll scourer. The scroll principle is the best for general all-round work, but for heavy, very dirty pieces, the old fashioned dolly is the best, as a better bottom scour and a better squeeze is thereby obtained; but for pieces which do not contain a large excess of dirt, the scroll or open width principle is to be recommended.—W. E. Knowles, before the Huddersfield Textile Society.

The General Processing Company, Allegheny Ave. and Amber St., Philadelphia, Pa., have taken over the business formerly operated as the Dragon Dye Works, and assure the trade of a service characterized by a moderate range of prices, accurate processings and prompt deliveries.



AN EXTERIOR VIEW OF THE DRAPER COMPANY'S NEW OFFICE BUILDING

THE DRAPER COMPANY'S NEW OFFICE BUILDING

In our December issue we published a description of the new office building of the Draper Co. at Hopedale, Mass., and are now enabled to show a view of this handsome building in which the office force is now comfortably settled.

The inside measurements of this building are 240 ft. in length by 100 ft. in width, and there is a vault in addition, which does not show in the picture, which measures 40 ft. square. This is built out from the further side of the building as an ell. The building includes all the available frontage between the streets at the north and south end. It is constructed of red brick with terra cotta trimmings and Milford granite under-pinnings. It is connected with the works across the street by a subway which leads from the basement of the building. A comparison of this new office with the one occupied in 1880 gives an idea of the growth of this business. The old office was 44 by 44 ft., just about the size of the big vault in the new office. In 1880 the office force consisted of six men as compared with ninety in 1911.

BELLICOSA

The new finishing compound called Bellicosa, manufactured by the Arabol Manufacturing Co., 100 William St., New York, is recommended for finishing satin and satin taffetas. It gives the peculiar handle that is at present so popular with the trade.

THE SHRINKAGE OF WOOL

A problem that has attracted considerable attention, owing to the demand for unshrinkable woolen underwear, is the prevention of shrinkage in wool. In one form or another chlorination has been extensively adopted, but in some cases the wool is left in a harsh condition. According to a recent patent, however, a process is now available for avoiding the liability of wool to shrink, while retaining its structure entire, and also its softness, combined with the possibility of easy bleaching.

In this new method (Lumpp's), washed wool—in loose, sliver, skein, or fabric form—is passed through a bath made up as follows: Chloride-of-lime solution or sodium hypochlorite (made electrolytically or from the former by means of soda) is, after its contents in active chlorine have been ascertained, neutralized with an organic acid, such as acetic acid, or an inorganic acid, such as phosphoric acid. Two to 2 1/2 parts of formaldehyde are added to each 1 part of active chlorine. The wool is placed in this solution at the ordinary temperature, and the concentration is arranged according to the kind of material, so that to 100 parts of wool 1 to at most 4 parts of active chlorine are provided. The necessary quantity of water results of itself. The goods lie or circulate in this liquor about 15 to 30 minutes, the chlorine being fully, and the formaldehyde partially, exhausted. The wool thus treated is first well washed with sodium peroxide (neutralized with oxalic acid), and then bleached with sulphurous acid. In the subsequent dyeing the colors are sadder and are more permanent.

By this patented treatment the wool is claimed to lose its capability of felting and shrinking, but to retain its structure and softness, and is very well adapted for bleaching and dyeing, gaining in the latter case in fastness, and having also the property of preventing troublesome perspiration. —The Textile Manufacturer.

MOHAIR INDUSTRY IN BRADFORD, ENGLAND

From Consul Augustus E. Ingram, Bradford

The antiquity of mohair, the long silky wool of the Angora goat, as a textile fabric is well known. The native home of the Angora goat is in the mountainous interior of Asia Minor. The center of the district is Angora, in Armenia, about 220 miles from Constantinople, and the goat derives its name from this small town. The name "mohair" is said to be a corruption of the French form of an Arabic word for haircloth and has nothing to do with the English word hair.

Until comparatively recent times almost the entire supply of mohair was obtained from Constantinople. For some time all attempts made to acclimatize the Angora goat elsewhere proved unsuccessful, as when removed from its native mountains the wool deteriorated and lost its distinctive features. It has now, however, proved successful in South Africa, especially in the Natal district, whence the so-called blue hair is now exported. Mohair is also successfully grown in Australia and in the United States. The best mohair is still shipped from Constantinople and is called Turkey mohair, though by far the largest quantity received in the United Kingdom comes from South Africa. The growers in South Africa clip twice a year, there being a tendency otherwise for the goats to shed their hair. The first clip, called the summer hair, is shorn in April and is the longer hair; the second clip in August, called the winter hair, is the short hair. The finest hair is that of the so-called "Cape kids," being the first clip ever taken from the animal. The following are the statistics of importations into the United Kingdom for 1911: Turkey mohair, 37,378 bags, or 6,650,000 pounds; Cape mohair, 36,300 bales, or 18,110,494 pounds; alpaca, 24,092 bales. The alpaca is all sold in Liverpool. The bales weigh approximately 200 pounds each.

Alpaca (the hair of the alpaca or Peruvian goat) is a material often classified with mohair, as both of these fibers are distinguished for their silky texture and bright silvery, almost metallic, luster. Alpaca was the first of these raw materials to be utilized commercially in Bradford.

In 1832 a firm of wool brokers in Liverpool received a consignment of alpaca direct from Peru, but not until 1836 was a purchaser for it discovered. This purchaser was Titus Salt, of Bradford, who had already discovered the commercial possibilities of Russian or Donskoi wool, and the account of this sale, so surprising to the disheartened importers, and of the difficulties encountered by Mr. Salt in devising the necessary processes in order to make from this unattractive fiber a beau-

tiful and lustrous cloth, is one of the most interesting chapters in the textile history of Bradford. So successful was this experiment that in a few years alpaca cloth was on sale everywhere, and the use of mohair was also undertaken. For many years Mr. Salt carried on the new manufacture in Bradford, occupying several factories in the town. In 1853 he erected a model factory and village just outside of Bradford, on the banks of the River Aire, the place now being called Saltaire. Provision was made for all the needs of the inhabitants, including schools, hospitals, parks, etc. These mills now contain 83,000 spindles and 600 looms, and their productions consist of alpaca, mohair, cashmere, camel's hair, worsted and silk yarns and goods, though the specialties of manufacture are alpaca and mohair.

The following statistics show the foreign trade in mohair in the United Kingdom:

Year.	Imports.	Reexports.	Net Imports.
Mohair.	Pounds.	Pounds.	Pounds.
1908	25,383,396	762,526	24,620,870
1909	30,333,791	765,497	29,568,294
1910	29,951,746	1,044,922	28,906,824
Alpaca, Etc.	Pounds.	Pounds.	Pounds.
1908	4,775,666	861,549	3,914,117
1909	5,277,539	588,429	4,689,110
1910	5,878,470	578,962	5,299,508

The exports of alpaca and mohair yarn amounted to 13,766,400 pounds in 1908; 15,808,800 pounds in 1909; and 17,372,100 pounds in 1910. Germany was by far the largest purchaser, taking in these three years a total of 33,307,200 pounds, followed by France and Russia. Small amounts are also sent to the United States. It was said at one time that these yarns could not be spun to advantage in foreign countries, owing to the climate, but this is gradually being overcome in the United States and Russia.

BRADFORD THE CENTER OF THE INDUSTRY

The business in mohair really commenced about 70 years ago, the raw material being imported into London and Liverpool from Asia Minor by several rich Greek firms, but the Bradford mohair merchants soon began to import direct from Constantinople, and these direct importations have since developed so extensively that the bulk of the mohair grown in Asia Minor and in South Africa is brought direct to Bradford. It has been computed that Bradford purchases over two-thirds of the mohair clip. Mohair grown in the United States has been purchased in Bradford, though not recently, as the American mills are apparently consuming all the domestic supply. It is also said that the mohair grown in the United States is not of so good a quality as the Turkish or the South African. Shipments of mohair to the United States from this district have been made regularly for many years past, the largest amount being $353,097, in 1907, the shipments declining to $140,220, in 1910.

The demand for mohair is very largely dependent on the prevailing fashions and fluctuates accordingly. When the demand for ladies' dress goods runs to bright fabrics, large quantities are required. The braiding of ladies' dresses and the edging of men's coats and vests, which is a variable fashion, also seriously affects the consumption of mohair. When the price of mohair rises, either from excess of demand or shortage of clip, manufacturers turn to the luster wools (such as Leicesters, Lincolns, etc.) as a cheaper substitute or blending material.

Not only are large quantities of mohair dress fabrics, known as brilliantines, etc., manufactured in the Bradford district, but also linings, plushes, etc. Alpaca is largely used for linings, but the mercerized cotton fabrics have proved serious competitors. Most of the mohair and alpaca is woven with cotton warps. Mohair is also used in the manufacture of braid, buttons and bindings. The manufacture of furniture plush also calls for large quantities of mohair yarn, this plush being largely used, both in Europe and in the United States, for the upholstering of railway carriages and also for sofas, chairs and table covers. Imitation sealskins, astrakhans and other skins are also made from mohair, and such perfection has been reached in their manufacture as to render it difficult to distinguish the imitation from the genuine without close inspection. Mohair has also been used to considerable extent for doll's hair and for theatrical beards, wigs, etc., but of late a new creping or plaiting machine has enabled the utilization of other lustrous wools for this purpose.

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REMOVAL

The Champlain Silk Mills announce that in order to increase their facilities for adequately serving customers, they have moved their general offices to their Brooklyn Mills, 500 Driggs Ave., Brooklyn, N. Y. All inquiries and correspondence should be addressed to that city. This change is made necessary on account of the growth of their business and mills.

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*Illinois, Chicago. Oscar Heineman Co., recently incorporated with authorized capital of $600,000, has organized with Oscar Heineman as president and buyer and Dagmar Romer, treasurer. The concern manufactures silk yarns for manufacturing purposes and has a plant at Armitage Ave., corner of Fairfield, where 15,000 spindles are operated, giving employment to 450 hands.

*Indiana, Evansville. A reorganization of the Evansville Woolen Mill Co. has not been fully determined upon. Recently the property was sold at bankruptcy sale to bondholders for $15,000, after an idleness of several months. Walter M. Schmitt, president and treasurer of the old company, will be interested in the new company if one is formed.

Maine, Dexter. The spinning and carding rooms at the Amos Abbott Mill are running day and night. Before the Abbott & Latimer plant was taken over by the Greenwoods, Amos Abbott & Co. operated carding and spinning machinery on yarns for their main plant as their extra yarn was required to keep the weaving department running in full.

Recent Textile Patents

BOBBIN HOLDING Device. 1,015,023. Frank R. Hatch, Haverhill, Mass.

DYEING TUB. 1,014,243. Radcliffe B. Mills, Philadelphia, Pa.

FABRICS. Producing an Undulated or Loosened Surface Upon. 1,012,914. Marius Ratignier, Lyon and Henry Pervilhac, Villeurbanne, France.

HOPPER, Filling-replenishing. 1,014,770. Jonas Northrop, Hopedale, Mass.

KNITTING MACHINE. 1,013,058. Joseph G. Prosser, Chicago, Ill.

KNITTING MACHINE, Circular. 1,013,471. William T. Barratt, Bennington, Vt.

KNITTING MACHINE Dial-holding Device. 1,012,966. George L. Ballard, Norristown, Pa.

KNITTING MACHINE Needle. 1,015,109. L. N. D. Williams, Camden, N. J.

KNITTING MACHINE Needle. 1,015,108. L. N. D. Williams, Camden, N. J.

KNITTING MACHINE, Rib. 1,012,982. Walter D. Butz, Norristown, Pa.

KNITTING MACHINE Take-up Mechanism. 1,012,710. Walter F. Rolston, Rockford, Ill.

LOOM, Filling-replenishing. 1,014,844. Jonas Northrop, Hopedale, Mass.

LOOM Warp Stop Motion. 1,013,966. Wallace I. Stimpson and Alonzo E. Rhoades, Hopedale, Mass.

LOOM Warp Stop Motion. 1,014,399. William H. Knox and Harry M. White, Philadelphia, Pa.

LOOMS, Weft-end Support in Northrop. 1,013,884. Alfred Marchal, Crouhans, France.

LOOM Shuttle-Checking Device. 1,013,217. Anker Petersen, Winthrop, Mass.

LOOM Filling-severing Device. 1,102,875. Henry Lussier, Salem, Mass.

LOOM-BEAMS, Supporting Means for. 1,013,443. Alonzo E. Rhoades, Hopedale, Mass.

LOOM Filling Fork Mechanism. 1,013,375. Edward A. Cuniff, New Bedford, Mass.

LOOMS, Batten Structure for Narrow Ware. 1,013,365. Frederick Benz, Jr., Haledon, N. J.

LOOM Harness-heddle. 1,014,771. Edward F. Parks, Providence, R. I.

LOOM Temple. 1,013,543. George M. Foster, Manchester, N. H.

SHUTTLE. 1,014,661. Charles E. McGill, Binghamton, N. Y.

SPINNING MACHINE. 1,013,872. Sebastian Ziani de Ferranti, London, Eng.

SEWING MACHINES, Feeding Mechanism for. 1,014,298. Charles F. Gray, Sierra Madre, Cal.

SPINNING MACHINES, Driving Mechanism of Ring. 1,012,946. Julius Weinbrenner, Thann, Germany.

SPINNING MULES, Yarn Evening Attachment for. 1,014,299. Robert J. Harrington, Dalton, Mass.

SPINNING FRAME. 1,012,714. Eppa H. Ryon, Worcester, Mass.

SEWING MACHINES, Buttonhole-Stitching Attachment for. 1,012,709. William J. Robinson, Denver, Col.

SHUTTLE Threading Device. 1,013,425. Harry A. Murphy and Joseph F. Simpson, Fulwood, Preston, Eng.

SPINNING or Twisting Apparatus, Traverse-motion for Yarn. 1,013,846. Alonzo E. Rhoades, Hopedale, Mass.

SPINNING MACHINE. 1,013,748. Frederick S. Culver, Taunton, Mass.

WINDING MACHINE. Yarn or Like. 1,014,981. Edwin Sykes, Huddersfield, Eng.

WOVEN FABRIC. 1,012,825. Thomas B. Dornan, Philadelphia, Pa.

YARN Tension Device. 1,014,980. Edwin Sykes, Huddersfield, Eng.

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APPLICATIONS FOR REGISTERED TRADE MARKS

These applications have been officially published by the U. S. Patent Office, so that any person who believes a registration would interfere with established rights, may have an opportunity to object within the specified time.

55,052. Hosiery. Mark: Arrowhead Hosiery. Owner: Richmond Hosiery Mills, Chattanooga, Tenn.

57,361. Mercerized embroidery cotton. Mark: Helios. Owner: Wilh. Heberbrand, Elberfeld, Germany.

57,424. Ribbons. Mark: Unicorn. Owner: U. R. T. Lund, Catasauqua, Pa.

58,985. Cotton piece goods. Mark: Atlantic. Owner: Atlantic Cotton Mills, Lawrence, Mass.

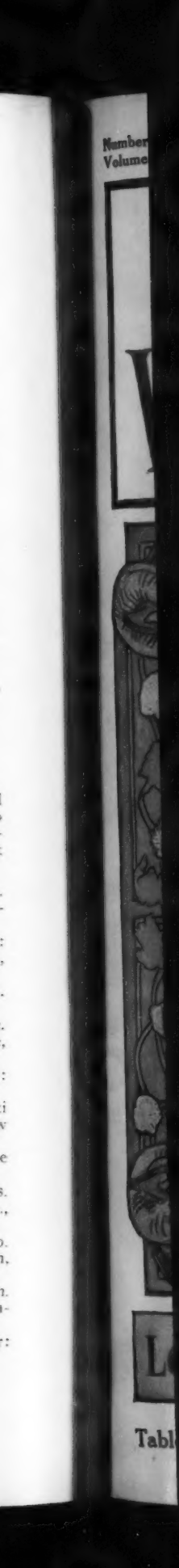
59,159. Hosiery. Mark: Radmoor. Owner: Thos. E. Brown & Sons, Philadelphia, Pa.

59,341. Colored flannel piece goods. Mark: Anti Tarnish. Owner: Denzer & Nathan, New York.

59,797. Spool cotton. Mark: Fenia. Owner: The American Thread Co., Jersey City, N. J.

57,125. Mixed silk and worsted piece goods. Mark: Sumar. Owner: E. B. Moore & Co., New York.

57,784. Knitting machines. Mark: W. Mfg. Co. Owner: The Wildman Mfg. Co., Norristown, Pa.

59,515. Worsted cloths. Mark: Singleton. Owner: Perseverance Worsted Co., Woonsocket, R. I.

59,926. Cotton piece goods. Mark: Devil. Owner: Morris Rosenstein, New York.